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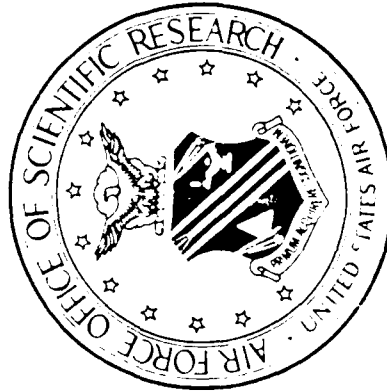
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# AIR FORCE OFFICE OF SCIENTIFIC RESEARCH

Air Force Systems Command

AFOSR

TECHNICAL REPORT SUMMARIES



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**AFOSR**

**TECHNICAL REPORT SUMMARIES**

**THIRD QUARTER 1989**

**PREPARED BY  
DEBRA TYRRELL, CHIEF  
TECHNICAL DOCUMENTS SECTION  
AFOSR/XOTD  
BOLLING AFB, DC 20332-6448  
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AFOSR awards grants and contracts for research in areas of science relevant to the needs of the Air Force. Research is selected for support from proposals received in response to the Broad Agency Announcement originating from scientists investigating problems involving the search for new knowledge and the expansion of scientific principles. Selection is on the basis of scientific potential for improving Air Force operational capabilities, originality, significance to science, the qualification of the principal investigators, and the reasonableness of the proposed budget.



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Contract/Grant Number - The instrument control number identifying the contracting activity and funding year under which the research is initiated.

Project Number - A number unique to a particular area of science; e.g., 23'4 is the project number for mathematics.

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Proceedings of the International Conference (3rd) on Combinatorial Mathematics Held in New York on 10-14 June 1985. (Annals of the New York Academy of Sciences. Volume 555).  
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Proceedings of the International  
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AD-A211675 REPORT DATE: 88 FINAL REPORT

Visual Motion Perception.  
AD-A210994 REPORT DATE: 31 JAN 89 ANNUAL REPORT

Visualizing and Rhyming Cause Differences in Alpha Suppression.  
AD-A210005 REPORT DATE: 12 MAY 89 ANNUAL REPORT

Wavefront Propagation for Reaction-Diffusion Systems of PDE.  
AD-A210862 REPORT DATE: MAR 89 ANNUAL REPORT

Wave-Mode Coordinate Analysis of 'L' Junction in LSS.  
AD-A211116 REPORT DATE: 30 MAR 89 ANNUAL REPORT

1-Methyl-3-Ethylimidazolium Hydrogen Dichloride: Synthesis and Application to the study of Protons in Ambient-Temperature Chloroaluminate Ionic Liquids.  
AD-A211526 REPORT DATE: 88 FINAL REPORT

24-Hour Mean Plasma Hormone Levels in Men with Coronary Heart Disease.  
AD A209868 REPORT DATE: 26 JUL 79 FINAL REPORT

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DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EV109K

AD-A211 744

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AD-A211 744 CONTINUED

PENNSYLVANIA STATE UNIV UNIVERSITY PARK DEPT OF  
MECHANICAL ENGINEERING

FLOW FIELDS, LASER APPLICATIONS, LAYERS, MACH NUMBER,  
MATHEMATICAL PREDICTION, OPTICAL ANALYSIS, SKIN FRICTION,  
SUPERSONIC CHARACTERISTICS, SUPERSONIC WIND TUNNELS,  
COMPUTER PROGRAM VERIFICATION.

(U) Experimental Research on Swept Shock Wave/Boundary  
Layer Interactions.

DESCRIPTIVE NOTE: Final rept. 1 Apr 86-31 Mar 89,

IDENTIFIERS: (U) PE61102F, WUAFOSR2307A1.

JUN 89

PERSONAL AUTHORS: Settles, Gary S.

REPORT NO. PSU-ME-R-88/89-0068

CONTRACT NO. AFOSR-86-0082

PROJECT NO. 2307

TASK NO. A1

MONITOR: AFOSR  
TR-89-1055

UNCLASSIFIED REPORT

ABSTRACT: (U) An experimental research effort on the subject of swept shock wave interactions with turbulent boundary layers is reported. The research relied largely on non-intrusive, laser-based optical flow diagnostics. Experiments were carried out to define the Mach number influence, flowfield structure, and quantitative skin friction behavior of fin-generated swept interactions over the supersonic range from March 2.5 to 4.0, including weak, moderate, and strong interactions. The results of this research have given new insight into the fin-interaction flowfield structure, which involves a jet-impingement process caused by shockwave bifurcation. High skin friction levels were measured in the vicinity of this jet impingement and were used for the validation of computational predictions carried out by others. Keywords: Shock wave interactions; Interactional aerodynamics; Compressible boundary layers; Turbulent Boundary Layers; Supersonic wind tunnels; Flow visualization; Optical measuring (JHD)

DESCRIPTORS: (U) \*COMPRESSIBLE FLOW, \*INTERACTIONS,  
\*SHOCK WAVES, \*TURBULENT BOUNDARY LAYER, AERODYNAMICS,  
COMPRESSIVE PROPERTIES, COMPUTATIONS, DIAGNOSIS(GENERAL).

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DTIC REPORT BIBLIOGRAPHY MATERIAL NO. EV109K

AD-A211 737 11/6.1 11/2 20/11 AD-A211 737 CONTINUED

MATERIALS RESEARCH SOCIETY PITTSBURGH PA

(U) Materials Research Society Symposium Proceedings in Reno, Nevada on 5-7 April 1988. Materials Stability and Environmental Degradation.

DESCRIPTIVE NOTE: Final rept. 1 Dec 87-31 Dec 88.

DEC 88 417P

PERSONAL AUTHORS: Barkatt, A.; Verink, E. D., Jr.; Smith, L. R.

CONTRACT NO. AFOSR-85-2308

TASK NO. 51

MONITOR: AFOSR TR-89-1191

UNCLASSIFIED REPORT

Availability: Materials Research Society, 9800 McKnight Rd., Suite 327, Pittsburgh, PA 15237 HC \$47.00. No copies furnished by DTIC/NTIS.

ABSTRACT: (U) The symposium covered a broad range of subjects related to materials stability and corrosion phenomena. Stability and corrosion resistance have become the primary considerations. Combinations of materials, rather than single materials, are needed in many cases to satisfy such needs. Corrosion and degradation mechanisms in different types of materials--metals, crystalline composites, and glasses--exhibit a surprisingly high potential for correlation and cross-fertilization. Carbon/carbon composites have become the materials of choice for applications requiring high tensile strength and light weight at temperatures between 2000 F and 3200 F. The development of such materials is based on study of the mechanisms of oxidation, volatilization, interaction, and

sufficiently reactive to bond to human bone and soft tissue yet ductile enough to resist dissolution in the body. Materials must be sufficiently suitable for use in implants. Corrosion in ceramics, glasses, and metals and crack propagation studies were reported. Keywords: Nuclear reactor materials; Composite materials; Alloys; Radiation damage; Coatings; Surfaces; Corrosion inhibition; Hydration; Deterioration. (aw)

DESCRIPTORS: (U) \*CARBON CARBON COMPOSITES, \*CERAMIC MATERIALS, \*COATINGS, \*CORROSION, \*GLASS, \*METALS, ALLOYS, ATTACK, BONES, CHEMICAL REACTIONS, COMPOSITE MATERIALS, CORROSION, CORROSION RESISTANCE, CRACK PROPAGATION, CRACKS, CRYSTALS, DEGRADATION, DETEIORATION, ENVIRONMENTS, HIGH STRENGTH, HUMAN BODY, HYDRATION, IMPLANTATION, INTERACTIONS, LIGHTWEIGHT, MATERIALS, MOISTURE, NUCLEAR REACTORS, OXIDATION, RADIATION DAMAGE, REACTIVITIES, REACTOR MATERIALS, SOFT TISSUES, STABILITY, SURFACES, SYMPOSIA, TEMPERATURE, TENSILE STRENGTH, VOLATILITY.

IDENTIFIERS: (U) PE61102F, WUAFOSR2306B1.

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DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVI09K

AD-A211 731

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AD-A211 731 CONTINUED

MASSACHUSETTS INST OF TECH CAMBRIDGE DEPT OF CHEMISTRY

(U) High Precision Dipole Moments in A 1(A2) Formaldehyde  
Determined via Stark Quantum Beat Spectroscopy.

APR 89

PERSONAL AUTHORS: Vaccaro, P. H.; Zabludoff, A.; Camera-  
Palino, M. E.; Kinsey, J. L.; Field, R. W.

CONTRACT NO AFOSR-85-0381

PROJECT NO. 2303

TASK NO. B1

MONITOR: AFOSR  
TR-89-1161

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Jnl. of Chemical Physics, v90  
n8 p4150-4167, 15 Apr 89.

ABSTRACT: (U) The high resolution technique of Stark quantum beat spectroscopy is used to examine the electric dipole moment function for the first excited singlet state (A1, A2) of formaldehyde-h2 and formaldehyde-d2. The high precision of these measurements enables detailed determination of alpha-axis dipole moment components  $\mu_{\alpha}(a)$  for individual  $J = 2$  rovibronic levels in the V4 out-of-plane bending mode. In the case of 2(1,1) rotational levels, we find  $\mu_{\alpha}(a) \propto$  to the O power = 1.4784 (7) D and  $\mu_{\alpha}(a) \propto$  to the 1st power = 1.4678 4 to the 1st power D for H2CO. For D2CO the measured 2(1,1) dipole moments are  $\mu_{\alpha}(a) \propto$  to the O power = 1.4693 (3) D, and  $\mu_{\alpha}(a) \propto$  to the 3rd power = 1.4786(7) D. The state specific variations in  $\mu_{\alpha}(a)$  revealed by this study reflect the structural influences exerted by the pervasive  $S(1) \rightarrow S(0)$  nonadiabatic interactions and the pyramidally distorted equilibrium configuration which characterizes the A state of formaldehyde. The origin and experimental manifestation of the out-of-plane dipole moment component  $\mu_{\alpha}(a)$  in nonrigid A 1A2 formaldehyde is also discussed. Reprints: (AW)

DESCRIPTORS: (U) \*DIPOLE MOMENTS, \*FORMALDEHYDE, CONFIGURATIONS, DIPOLES, DISTORTION, ELECTRIC MOMENTS.

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EQUILIBRIUM(GENERAL), FUNCTIONS, HIGH RESOLUTION, PRECISION, REPRINTS, ELECTRONIC STATES, EXCITATION, MOLECULAR ENERGY LEVELS, MOLECULAR ROTATION, MOLECULAR VIBRATION, HYDROGEN, DEUTERIUM, SPECTROSCOPY.

IDENTIFIERS: (U) PEG1102F, WUAFOSR2303B1, Stark Quantum Beat Spectroscopy, Rovibronic Levels.

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DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EV109K

AD-A211 707 7/4 20/2 AD-A211 707 CONTINUED

PITTSBURGH UNIV PA SURFACE SCIENCE CENTER

(U) The Symmetrization Method for Enhancement of Digital  
ESDIAD Measurements: Increased Resolution for Study of  
Adsorbate Bond Directions.

88

PERSONAL AUTHORS: Szabo, A.; Kiskinova, M.; Yates, J. T.,  
Jr

CONTRACT NO. AFOSR-82-0133

PROJECT NO. 2303

TASK NO. A2

MONITOR: AFOSR  
TR-89-1187

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Surface Science, v205 p207-  
214 1988.

ABSTRACT: (U) A new data smoothing method for  
distinguishing the symmetrical features of digital ESDIAD  
patterns has been developed. The method is based on the  
assumption that ESDIAD patterns from adsorbed molecules  
on an 'n-fold' symmetric single crystal should in  
principle contain the same 'n-fold' symmetry, although in  
some cases this may be below the detection limit. The  
symmetrization method is applied to real ESDIAD data with  
the expected enhancement of the azimuthal symmetry of the  
ESDIAD pattern. Two strenuous tests have been devised to  
determine the reliability of the method: (i) quantitative  
comparison of azimuthal symmetry elements in the digital  
ESDIAD pattern with the substrate symmetry as determined  
by digital LEED in the same apparatus; (ii) qualitative  
comparison of physically-meaningful symmetry elements  
with non-physical symmetries. It is also shown in model  
calculations that the symmetrization procedure is  
effective in removing systematic noise from digital  
ESDIAD data. Keywords: Electron stimulated desorption;  
Ion angular distribution; Spectroscopy; Crystallographic  
symmetries; Chemisorption; Carbon monoxide; Crystals; Low  
energy electron diffraction; Platinum (111). Reprints.  
(AW)

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DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVIO9K

AD-A211 702

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IDAHO UNIV MOSCOW DEPT OF CHEMISTRY

(U) Allylations of ((Diethoxyphosphinyl)difluoromethyl) zinc Bromide as a Convenient Route to 1,1-Difluoro-3-alkenephosphonates.

AD-A211 702 CONTINUED

IDENTIFIERS: (U) PE61102F, WUAFOSR2303B2, Allylation, Zinc Bromides, Bromide/((Diethoxyphosphinyl) Difluoromethyl) Zinc, Alkene Phosphonates, Phosphonate/ Difluoro-2-3-Butadiene, Phosphonate/1-1-Difluoro 3-Alkene, Allyl Acetate, Propargyl Chloride.

89

PERSONAL AUTHORS: Burton, Donald J.; Sprague, Lee G.

CONTRACT NO. AFOSR-87-0067

PROJECT NO. 2303

TASK NO. B2

MONITOR: AFOSR  
TR-89-1086

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Jnl. of Organic Chemistry, v54 n3 p613-617 1989.

ABSTRACT: (U) The reaction of (diethoxyphosphinyl) difluoromethylzinc bromide, (EtO)2P(O) CF2ZnBr, with allylic halides was found to be catalyzed by Copper Bromide and represents a synthetically viable and convenient route to the title phosphonates. However, the reaction could be readily extended to allyl acetate. Propargyl chloride gave predominantly an allenic product, diethyl 1,1-difluoro-2,3-butadienephosphonate (4). The regiochemistry of the allylation reactions is controlled by steric factors such that the (EtO)2P(O)CF2 moiety is bound to the least sterically hindered allylic terminus. Evidence is presented for an SN2 vs SN2' type mechanistic interpretation, rather than the involvement of a symmetrical (Pi-allyl)Cu(III) intermediate and an oxidative addition/reductive elimination type mechanism. Reprints. (AW)

DESCRIPTORS: (U) \*PHOSPHONATES, \*SYNTHESIS(CHEMISTRY), \*ALKENES, \*FLUORINATED HYDROCARBONS, BROMIDES, COPPER, REPRINTS, ZINC, ORGANIC PHOSPHORUS COMPOUNDS, METHYL RADICALS, ETHYL RADICALS, CATALYSIS, STEREOCHEMISTRY, OXIDATION REDUCTION REACTIONS, ADDITION REACTIONS, ELIMINATION REACTIONS.

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AD-A211 699 9/1

AD-A211 699 CONTINUED

STATE UNIV OF NEW YORK AT BUFFALO DEPT OF CHEMISTRY

(U) Microelectrodes in the Examination of Anodic and Cathodic Limit Reactions of an Ambient Temperature Molten Salt.

DESCRIPTIVE NOTE: Rept. for 1 Dec 86-30 Jun 89.

88

PERSONAL AUTHORS: Carlin, Richard T.; Osteryoung, Robert A.

CONTRACT NO. AFOSR-87-0088

PROJECT NO. 2303

TASK NO. 82

MONITOR: AFOSR  
TR-89-1075

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Jnl. of Electroanalytical Chemistry, v252 p81-89 1988.

ABSTRACT: (U) Microelectrodes with dimensions of only a few micrometers offer numerous advantages over conventional electrodes. We have recently become interested in examining the electrochemical reactions constituting the anodic and cathodic limits of molten salts where the electroactive species are in concentrations exceeding 1 M. Two properties of microelectrodes which make them ideal for studying such high concentrations of electroactive species are: (1) low faradaic currents are realized, thus making it possible to employ standard electrochemical equipment for analyses, and (2) IR drop is minimal, thus reducing errors in applied potentials and reducing distortions of voltammograms. The highest possible concentration of electroactive species is achieved when the electrochemical window of the solvent itself is studied. For example, a Pt microelectrode has been employed to examine the solvent cathodic limit of undiluted nitrobenzene with 0.1 tetrabutylammonium perchlorate added as support electrolyte. Nearly nerstian reduction waves with diffusion limited current plateaus were

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DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVI09K

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AD-A211 698 CONTINUED

STATE UNIV OF NEW YORK AT BUFFALO DEPT OF CHEMISTRY

IDENTIFIERS: (U) PEG1102F, WUAFOSR2303B2.

(U) Reaction of Protons and Molybdenum Dimers in an Ambient-Temperature Molten Salt.

DESCRIPTIVE NOTE: Rept. for 1 Dec 86-30 Jun 89.

88

PERSONAL AUTHORS: Carlin, Richard T.; Osteryoung, Robert A.

CONTRACT NO. AFOSR-87-0088

PROJECT NO. 2303

TASK NO. B2

MONITOR: AFOSR  
TR-89-1082

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Inorganic Chemistry, v27n20  
p3675-3677 1988.

ABSTRACT: (U) We have recently reported the electrochemical interconversions of several molybdenum dimers in the ambient-temperature molten salt  $\text{AlCl}_3$ -1-ethyl-3-methylimidazolium chloride ( $\text{ImCl}$ ) the results of the study performed in a basic melt are summarized in Scheme I. Acidic melts are defined as melts where the  $\text{AlCl}_3/\text{ImCl}$  molar ratio is greater than one, and basic melts are melts where this ratio is less than one. These previous studies were hampered in part by the presence of protonic impurities in the melt. We have since found that the addition of  $\text{EtAlCl}_2$  to  $\text{AlCl}_3$ - $\text{ImCl}$  melts effectively removes these protonic impurities, forming  $\text{AlCl}_3$ , a component of melt. We have applied this purification method to melts containing molybdenum dimer and which wish to report several interesting reactions involving the addition and removal of hydrogen to the Mo-Mo quacupule judge bond  $\text{Mo}_2\text{Cl}_8$ . Melts, Reprints. (jes)

DESCRIPTORS: (U) \*ALLOYS, \*MELTS, \*MOLYBDENUM, \*DIMERS, ACIDS, HYDROGEN, PROTONS, PURIFICATION, RATIOS, REPRINTS, RESPONSE

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DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EV109K

AD-A211 694 11/2

AD-A211 694 CONTINUED

ILLINOIS UNIV AT URBANA DEPT OF CHEMISTRY

(U) A SANS (Small Angle Neutron Scattering) of Catalyst on the Growth Process of Silica Gels,

89

PERSONAL AUTHORS: Winter, R.; Hua, D.-W.; Thiagarajan, P.; Jonas, J.

CONTRACT NO. AFOSR-85-0345

PROJECT NO. 2303

TASK NO. A3

MONITOR: AFOSR  
TR-89-1137

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Jnl. of Non-Crystalline Solids, v108 p137-142 1989.

ABSTRACT: (U) The sol-gel process for preparing oxide glasses has attracted widespread attention in the last few years because it allows the preparation of glasses with very high homogeneity and the fabrication of glasses with special chemical composition; besides, processing can be performed at relatively low temperatures. It has been shown that the fluoride anion F<sup>-</sup> is one of the most effective catalysts in accelerating the gelation process. Small angle neutron scattering (SANS) experiments have been employed to investigate the structural evolution of uncatalyzed and fluoride catalyzed tetramethoxysilicate Si(OC<sub>2</sub>H<sub>5</sub>)<sub>4</sub>/CH<sub>3</sub>OH/H<sub>2</sub>O solutions from the sol to the gel state. The F<sup>-</sup> anion has been shown to be one of the most effective catalysts for the polycondensation of silica gels. The analysis of the Guinier and Porod regions of the scattering curves yields valuable information about the particle size, the structural evolution and the growth process of these systems. The theoretical concepts of percolation and fractal geometry are applied to interpret the experimental results and to compare them with computer simulations for different growth processes in order to ascertain the origin of the developing random polymer network structure. The effects of adding a strong nucleophilic catalyst, such as NaF, on the structural

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properties and the growth mechanism of silicon polymer in the course of the sol-gel transition is discussed.  
Keywords: Reprints; Glass. (kt)

DESCRIPTORS: (U) \*ANGLES, \*SILICON, \*SILICON DIOXIDE, \*STRUCTURAL PROPERTIES, CATALYSTS, CHEMICAL COMPOSITION, COMPUTERIZED SIMULATION, EVOLUTION (GENERAL), FABRICATION, GELATION, GELS, GLASS, GROWTH (GENERAL), HOMOGENEITY, LOW TEMPERATURE, NEUTRON SCATTERING, OXIDES, PARTICLE SIZE, PERCOLATION, POLYMERS, PREPARATION, REPRINTS, THEORY.

IDENTIFIERS: (U) PE61102F, WUAF05SR2303A3.

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## OTIC REPORT BIBLIOGRAPHY

## SEARCH CONTROL NO. EVIO9K

AD-A211 693

20/6

FLORIDA UNIV GAINESVILLE DEPT OF CHEMICAL ENGINEERING  
(U) Linear (Passive) and Non-Linear Guided and Studies in Glass.

DESCRIPTIVE NOTE: Final rept. 1 May 88-30 Apr 89.

JUL 89

PERSONAL AUTHORS: Ramaswamy, R. V.

CONTRACT NO. AFOSR-88-0189

PROJECT NO. 2303

TASK NO. A3

MONITOR: AFOSR  
TR-89-1142

## UNCLASSIFIED REPORT

ABSTRACT: (U) The primary object of the project is to investigate theoretically as well as experimentally the ion-exchange process and solgel technology for glass for signal processing applications. This report deals with the progress made in both the ion-exchange and the gel-silica waveguide technology. The study involved several sub-projects. 1. Passive, low-loss waveguides and tapers by  $\text{Ag}^+ - \text{Na}^+$  exchange. 2. Surface and buried channel waveguides by  $\text{K}^+ - \text{Na}^+$  exchange. 3. Fabrication and characterization of 3 dB cross-couplers. 4. Laser-assisted fabrication of waveguides in gel-silica. Keywords: Silver; Sodium; Solgel; Ion exchange. (KT)

DESCRIPTORS: (U) \*GLASS, BURIED OBJECTS, CHANNELS, INTEGRATED CIRCUITS, ION EXCHANGE, LOW LOSS, OPTICAL CIRCUITS, PASSIVE SYSTEMS, SIGNAL PROCESSING, SILVER, SODIUM, WAVEGUIDES.

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## UNCLASSIFIED

AD-A211 691

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INSTITUTE FOR COMPUTER APPLICATIONS IN SCIENCE AND  
ENGINEERING HAMPTON VA

(U) High Resolution Finite Volume Methods on Arbitrary Grids via Wave Propagation.

DESCRIPTIVE NOTE: Final rept. 1 Jun 85-31 Aug 87.

OCT 87

PERSONAL AUTHORS: LeVeque, Randall J.

REPORT NO. ICASE-87-68

CONTRACT NO. AFOSR-85-0189

PROJECT NO. 2304

TASK NO. A3

MONITOR: AFOSR  
TR-89-1129

## UNCLASSIFIED REPORT

ABSTRACT: (U) In previous work by the author, a generalization of Godunov's method for systems of conservation laws has been developed and analyzed that can be applied with arbitrary time steps on arbitrary grids in one space dimension. Stability for arbitrary time steps is achieved by allowing waves to propagate through more than one mesh cell in a time step. In this paper the method is extended to second order accuracy and to a finite volume method in two space dimensions. This latter method is based on solving one dimensional normal and tangential Riemann problems at cell interfaces and again propagating waves through one or more mesh cells. By avoiding the usual time step restriction of explicit method, it is possible to use reasonable time steps on irregular grids where the minimum cell area is much smaller than the average cell. Boundary conditions for the Euler equations are discussed and special attention is given to the case of a Cartesian grid cut by an irregular boundary. In this case small grid cells arise only near the boundary, and it is desirable to use a time step appropriate for the regular interior cells. Numerical results in two dimensions show that this can be achieved. (RH)

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DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVI09K

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AD-A211 675 20/5

DESCRIPTORS: (U) \*CELLS, \*GRIDS, \*INTERFACES, \*MESH,  
\*VOLUME, \*WAVE PROPAGATION, ACCURACY, BOUNDARIES,  
CONSERVATION, DIFFERENTIAL EQUATIONS, INTERNAL, NUMERICAL  
ANALYSIS, TIME.

MASSACHUSETTS INST OF TECH CAMBRIDGE DEPT OF CHEMISTRY

(U) Vibrationally Excited Formaldehyde: The Relationship  
between Vibrational Structure and Collisional  
Properties.

IDENTIFIERS: (U) PEG1102F, WUAFOSR2304A3.

88

PERSONAL AUTHORS: Temps, Friedrich; Halle, Scott; Vaccaro,  
Patrick H.; Field, Robert W.; Kinsey, James L.

CONTRACT NO. AFOSR-85-(381

PROJECT NO. 2303

TASK NO. B1

MONITOR: AFOSR  
TR-89-1166

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Jnl. of the Chemical Society,  
Faraday Transactions 2, v84 n9 p1457-1482 1988.

ABSTRACT: (U) Investigations of the physical and  
chemical properties of highly vibrationally excited  
polyatomic molecules at chemically significant energies  
are of fundamental interest for a detailed understanding  
of the dynamics of chemical reactions. A central question  
is that of state specific properties at 'low' energies vs.  
statistical molecular properties at 'high' energies and  
the spectral features which signal the transition between  
the two regimes. Reliable information on the distinctive  
molecular dynamics under these two conditions is of  
central importance for successful modelling of  
unimolecular reactions. Particular interest arises in the  
collisional excitation and relaxation of highly excited  
molecules. Current research focuses on the rates of  
energy transfer, the significance on intramolecular  
perturbations, the amount of energy transferred per  
collision, and the dependence of these properties on the  
initial and final vibrational states and excitation  
energies. Keywords: Molecular physics; Formaldehyde;  
Reprints. (KT)

DESCRIPTORS: (U) \*ENERGY TRANSFER, \*MOLECULAR PROPERTIES,  
\*POLYATOMIC MOLECULES, CHEMICAL PROPERTIES, CHEMICAL

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REACTIONS, COLLISIONS, DYNAMICS, ENERGY, EXCITATION,  
FORMALDEHYDE, HIGH ENERGY, LOW ENERGY, MOLECULAR  
STRUCTURE, MOLECULES, PHYSICAL PROPERTIES, RATES,  
RELIABILITY, REPRINTS, STATISTICS, VIBRATION.

OHIO STATE UNIV COLUMBUS DEPT OF CHEMISTRY

(U) Fast Heterogeneous Electron Transfer Rates for Glassy  
Carbon Electrodes without Polishing or Activation  
Procedures,

IDENTIFIERS: (U) PE61102F, WUAFOSR2303B1.

89

PERSONAL AUTHORS: Rice, Ronald; Alfred, Christie;  
McCreery, Richard

CONTRACT NO. AFOSR-88-0071

PROJECT NO. 2303

TASK NO. A1

MONITOR: AFOSR  
TR-89-1149

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Jnl. Electroanalytical  
Chemistry, v263 p163-169 1989.

ABSTRACT: (U) Glassy carbon (GC) is an attractive choice  
for an electrode material because it has a wide potential  
range, is inexpensive, readily available, and chemically  
inert in most electrolytes. The typical preparation of a  
GC electrode includes the removal of gross surface  
features by abrasion with silicon carbide paper and  
subsequent polishing with alumina. The electrochemistry  
of many redox systems such as ascorbic acid (AA), ferri/  
ferrocyanide, and dopamine on GC are very sensitive to  
the polishing procedure, with variations in the  
heterogeneous electron transfer rate constant ( $k_{et}$ ), for  
the  $Fe(CN)_6^{3-/4-}$  redox system covering at least three  
orders of magnitude. This variation has been attributed  
primarily to superficial impurities and polishing debris.  
Reprints. (AW)

DESCRIPTORS: (U) \*ELECTROCHEMISTRY, \*ELECTRODES, \*GLASSY  
CARBON, \*ELECTRON TRANSFER, \*REACTION KINETICS, ABRASION,  
ACTIVATION, ALUMINUM OXIDES, ASCORBIC ACID, DEBRIS,  
DOPAMINE, ELECTROLYTES, MATERIALS, OXIDATION REDUCTION  
REACTIONS, PAPER, POLISHING, RANGE (EXTREMES), REPRINTS,  
SILICON CARBIDES.

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DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVI09K

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AD-A211 673 7/4

IDENTIFIERS: (U) PE61102F, WUAFOSR2303A1, Ferrocyanide,  
Ferrocyanide.

NORTH DAKOTA STATE UNIV FARGO DEPT OF CHEMISTRY

(U) Intrinsic Reaction Coordinate Calculations for Very  
Flat Potential Energy Surfaces: Application to Singlet  
Si2H2 Isomerization.

DESCRIPTIVE NOTE: Rept. for 1 Nov 86-3) Oct 89.

89

PERSONAL AUTHORS: Koseki, Shiro; Gordon, Mark S.

CONTRACT NO. AFOSR-87-0049

PROJECT NO. 2303

TASK NO. B3

MONITOR: AFOSR  
TR-89-1170

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Jnl. of Physical Chemistry,  
v93 n1 p118-1125 1989.

ABSTRACT: (U) Silasilene is an important species that  
may appear in the chemical vapor deposition of silicon.  
This paper reports an intrinsic reaction coordinate (IRC),  
or a minimum energy path (MEP), of the isomerization from  
silasilene to bridged disilyne obtained by using the  
local cubic and quadratic approximations. These new  
approximations generate a correct IRC for this  
isomerization, while some conventional methods fail to  
predict a reasonable IRC because of the very flat  
potential energy surface. This reaction path bifurcates  
to two identical IRCs to reach bridged disilyne. The  
activation energy for this isomerizations is predicted to  
be less than 3 kcal/mol. This energy barrier may  
disappear at high temperatures. The paper also compares  
the IRCs on the simple potential energy surfaces of the  
ammonia inversion and the hydrogen cyanide isomerization  
generated by using the local cubic and quadratic  
approximations with those obtained by some conventional  
methods. Reprints. (AW)

DESCRIPTORS: (U) \*ISOMERIZATION, \*POTENTIAL ENERGY,  
\*SILANES, \*SURFACE REACTIONS, ACTIVATION ENERGY, AMMONIA.

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SEARCH CONTROL NO. EVI09K

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APPROXIMATION, MATHEMATICS), BARRIERS, CHEMICAL REACTIONS, ENERGY, HIGH TEMPERATURE, HYDROGEN CYANIDE, INVERSION, PATHS, QUADRATIC EQUATIONS, REPRINTS, RESPONSE, SILICON, SURFACES, VAPOR DEPOSITION, BIFURCATION (MATHEMATICS).

IDENTIFIERS: (U) PE61102F, WUAFOSR2303B3, \*Potential Energy Surfaces, Flatness, Singlet States, \*Silasilene, Intrinsic Reaction Coordinates, Minimum Energy Paths, Bridged Compounds, \*Disilene, Cubic Approximations, Energy Barriers.

AD-A211 672

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TEXAS UNIV AT AUSTIN DEPT OF CHEMISTRY

(U) Synthesis of Tetrakis(Trifluoromethyl) Lead.

89

PERSONAL AUTHORS: Juhlike, Timothy J.; Glanz, Jeffrey I.; Lagow, Richard J.

CONTRACT NO. AFOSR-88-0084

PROJECT NO. 2303

TASK NO. 82

MONITOR: AFOSR  
TR-89-1155

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Inorganic Chemistry, v28 p980 1989.

ABSTRACT: (U) An interesting new compound tetrakis(trifluoromethyl) has been prepared by a technique which promises to be a very broadly adaptable route to synthesis of new sigma-bonded metal compounds of relatively low thermal stability. This trifluoromethyl compound is one of the last remaining unsynthesized trifluoromethyl compounds of Groups IV, and although it is too unstable to be isolated at temperatures required for conventional synthetic methods (>100 C), it is stable at room temperature when isolated from radiation sources Reprints. (AW)

DESCRIPTORS: (U) \*SYNTHESIS(CHEMISTRY), \*LEAD(METAL), \*ORGANOMETALLIC COMPOUNDS, FLUORINATED HYDROCARBONS, ISOLATION, METHYL RADICALS, RADIATION, REPRINTS, ROOM TEMPERATURE, SOURCES, STABILITY, TEMPERATURE, THERMAL STABILITY.

IDENTIFIERS: (U) PE61102F, WUAFOSR2303B2, \*Trifluoromethyl lead, Lead/Tetrakis (Trifluoromethyl)

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PITTSBURGH UNIV PA SURFACE SCIENCE CENTER

(U) Compressed Co Overlayers on Pt(111) Evidence for  
Tilted Co Species at High Coverages by Digital ESDIAD.

88

PERSONAL AUTHORS: Kiskinova, M.; Szabo, A.; Yates, J. T., Jr

CONTRACT NO. AFOSR-82-0133

PROJECT NO. 2303

TASK NO. A2

MONITOR: AFOSR  
TR-89-1189

UNCLASSIFIED REPORT

ABSTRACT: (U) The existence of tilted carbon monoxide molecules in compressed Carbon monoxide overlayers on Platinum(111) has been detected using the digital ESDIAD method with enhanced resolution achieved by applying a retarding potential procedure to separate CO(+), CO\*, and O(+)-ESD products. Digital symmetrization was used for analysis of the ESDIAD data collected under field-free conditions. The CO tilting is consistent with the building of antiphase domain. Boundaries of close-packed terminal-CO species. It has been found that CO molecules tilt about 6 degs. off-normal at Co coverages higher than 0.6 CO/Pt. The azimuthal directions (equivalent to (110) of CO tilting indicate that the close-packed CO molecules are repelled along the nearest Pt-Pt neighbor directions. Studies of the thermal broadening of the CO+ ESDIAD pattern due to the tilted-CO molecules have shown that the maximum amplitude of the vibrational motion of the tilted-CO species occurs along the directions normal to the tilting plane. A comparison of the CO(+) and CO+ ESDIAD patterns has permitted approximate estimation of the distance of the image plane from the center of the charge for the CO(+) ESD product at the point of its origin. Keywords: Electron stimulated desorption angular distribution; Electron stimulated desorption spectroscopy; Chemisorption; Tilted adsorbate molecules; Adsorbate-adsorbate interactions; Reprints. (aw)

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NEW ORLEANS UNIV LA DEPT OF CHEMISTRY

(U) Computational Analysis of the Structures, Bond Properties, and Electrostatic Potentials of Some Nitrotetrahedranes and Nitroazetetrahedranes.

DESCRIPTIVE NOTE: Journal article,

89

PERSONAL AUTHORS: Politzer, Peter; Seminario, Jorge M.

CONTRACT NO. AFOSR-88-0068

PROJECT NO. 2303

TASK NO. 83

MONITOR: AFOSR  
TR-89-1019

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Jnl. of Physical Chemistry, v93 n12 p4742 4745 1989.

ABSTRACT: (U) The structures and properties of six nitro derivatives of tetrahedrane and its mono and diaza analogues have been determined by means of ab initio self-consistent field computations. Geometries optimized at the 3-21G level were used to calculate bond deviation indices (as measures of bond strain), bond orders (to determine reactive bond strengths) and molecular electrostatic potentials, as guides to reactive behavior. The bond properties (length, degree of strain, and strength) are significantly influenced by the conformation of the nitro group, although there was found to be essentially no energy barrier to its rotation. For the polynitro derivatives, the general result is a slight strengthening of C-C bonds. The molecular electrostatic potentials are also considerably affected by the electron-withdrawing -NO2 substituents; the negative potentials associated with the strained C-C bonds in unsubstituted systems are absent, and the basicities of the azo nitrogens are greatly reduced. Keywords: Strained molecules; Bond strain; Chemical bonds; Carbon; Nitro radicals. Reprints. (AM)

DESCRIPTORS: (U) \*ELECTROSTATIC CHARGE, \*NITRO RADICALS, \*MOLECULAR STRUCTURE, \*POTENTIAL ENERGY, \*ORGANIC COMPOUNDS, BARRIERS, CARBON, CHEMICAL BONDS, CHEMICAL DERIVATIVES, COMPUTATIONS, CONFORMITY, CONSISTENCY, ENERGY INDEXES, MOLECULES, NITROGEN, REACTIVITIES, REPRINTS, MOLECULAR ROTATION.

IDENTIFIERS: (U) PEG1102F, WUAFOSR2303B3, \*Nitrotetrahedranes, \*Nitroazetetrahedranes, Ab Initio Computations, Bond Deviation Indices, Bond Strain, Bond Orders, Bond Strength, Electrostatic Potentials, Conformation, Carbon Carbon Bonds, Strained Molecules

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DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVI09K

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CERAMATEC INC SALT LAKE CITY UT

(U) New Mechanism for Toughening Ceramic Materials.

DESCRIPTIVE NOTE: Final rept. 15 Jul 87-14 Dec 88,

MAY 89

PERSONAL AUTHORS: Cutler, Raymond A.; Virkar, Anil V.

REPORT NO. CERAMATEC-8981701

CONTRACT NO. F49620-87-C-0077, \$DARPA Order-5994

PROJECT NO. 9999

TASK NO. 99

MONITOR: AFOSR  
TR-89-1097

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Prepared in cooperation with Utah Univ., Salt Lake City. Dept. of Materials Science.

ABSTRACT: (U) A 14 month study by Ceramtec, with a subcontract to the University of Utah, was initiated in order to determine if ferroelastic switching contributes to toughening in ceramic materials. Domain switching in ZrO<sub>2</sub> single crystals (heat treated to minimize transformation) at 1400 C was used to show that ferroelastic switching is a process which occurs at temperatures in excess of the monoclinic to tetragonal transformation temperature. These data, coupled with fracture toughness measurements of 8 MPa.m<sup>1/2</sup> at 1000 C, show that ferroelastic toughening has the potential for toughening at temperatures in excess of that possible by transformation toughening. Experiments on PZT, SrZrO<sub>3</sub> and Gd<sub>2</sub> (MoO<sub>4</sub>)<sub>3</sub> were used to show that ferroelastic switching can contribute to toughening. The time dependence of switching was demonstrated using PZT ceramics. Dopants were added to polycrystalline TZP materials in order to substantially increase their fracture toughness. In the case of SrO additions, strontium aluminate platelets, formed in-situ during sintering, contributed to toughness. Keywords: Zirconium oxides, Ceramic materials, Polycrystalline lead Zirconate

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EYE RESEARCH INST OF RETINA FOUNDATION BOSTON MA

(U) Eye Movements and Spatial Pattern Vision.

DESCRIPTIVE NOTE: Final rept. 1 Mar 86-30 Apr 89,

JUL 89

PERSONAL AUTHORS: Arend, Lawrence E.

CONTRACT NO. AFOSR-86-0128

PROJECT NO. 2313

TASK NO. A5

MONITOR: AFOSR  
TR-89-1151

UNCLASSIFIED REPORT

**ABSTRACT:** (U) Models of lightness and color perception must take account of human color constancy, a tendency for apparent surface color to be relatively independent of the color and intensity of the illuminating light source. Observers matched the lightness and brightnesses of regions in simple and complex achromatic spatial patterns. The data showed that the observers' knowledge of the surface reflectances (revealed by lightness matches) was unaffected by changing brightness of the same surfaces (revealed by brightness matches). In the analogous chromatic experiments, observers matched the hue and saturation of patches or the patches' apparent surface colors. The observers' knowledge of the surface colors was not as reliable as in the achromatic case. Patches' hues and saturations matched when their chromaticities were approximately the same. Shifts of hue attributable to simultaneous color contrast were in the correct direction but too small to produce hue constancy. **Keywords:** Visual perception, Spatial pattern vision, Visual illusions, Color vision. (AW)

**DESCRIPTORS:** (U) \*COLOR VISION, \*EYE MOVEMENTS, \*PATTERN RECOGNITION, \*BRIGHTNESS, CHROMATICITY, COLORS, CONTRAST, HUMANS, ILLUMINATION, ILLUSIONS, LIGHT SOURCES, OPTICAL IMAGES, PATTERNS, REFLECTANCE, SATURATION, SPATIAL DISTRIBUTION, SURFACES, SYNCHRONISM, VISION, VISUAL PERCEPTION.

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CARNEGIE-MELLON UNIV PITTSBURGH PA DEPT OF MATHEMATICS

IDENTIFIERS: (U) Stream Functions, Deflated Conjugate Gradients, PE61102F, WUAFOSR2304A3.

(U) Efficient Finite Element Solution of Navier-Stokes Equations and Related Topics.

DESCRIPTIVE NOTE: Final technical rept. 1 Jun 84-31 May 89.

89

PERSONAL AUTHORS: Nicolaidas, R. A.

CONTRACT NO. AFOSR-84-0137

PROJECT NO. 2304

TASK NO. A3

MONITOR: AFOSR  
TR-89-1180

UNCLASSIFIED REPORT

ABSTRACT: (U) Research efforts were directed towards a number of different topics connected with numerical methods for incompressible fluid flows. The subject groupings were as follows: 1. Finite element techniques (7 Papers) Stability of discretizations, Stream function methods and pressure recovery, Nonconforming schemes. 2. Vortex techniques (3 Papers) Higher order vortex algorithms, Analysis and computation. 3. Solution algorithms (5 Papers) Deflated conjugate gradients, Iterative methods for arbitrary meshes, Domain decomposition methods. 4. Fluid mechanics and phase transitions (3 Papers) Cahn-Hilliard equation analysis and algorithms, Stationary and evolutionary cases. 5. Complementary volume methods (2 Papers) Vorticity-velocity methods, Primitive variable methods. 6. Control theory (1 Paper). (JHD)

DESCRIPTORS: (U) \*FINITE ELEMENT ANALYSIS.  
\*INCOMPRESSIBLE FLOW, \*NAVIER STOKES EQUATIONS, ALGORITHMS, CONTROL THEORY, DECOMPOSITION, EFFICIENCY, FLUID MECHANICS, FUNCTIONS(MATHEMATICS), ITERATIONS, NUMERICAL METHODS AND PROCEDURES, PHASE TRANSFORMATIONS, PRESSURE, RECOVERY, SOLUTIONS(GENERAL), VARIABLES, VORTICES.

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OHIO STATE UNIV COLUMBUS DEPT OF CHEMISTRY

(U) Activation of Highly Ordered Pyrolytic Graphite for Heterogeneous Electron Transfer: Relationship between Electrochemical Performance and Carbon Microstructure,

89

PERSONAL AUTHORS: Bowling, Robert J.; Packard, Richard T.; McCreery, Richard L.

CONTRACT NO. AFOSR-88-0071

PROJECT NO. 2303

TASK NO. A1

MONITOR: AFOSR  
TR-89-1147

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Jnl. of the American Chemical Society, v111 n4 p1217-1223 1989.

ABSTRACT: (U) The electrochemical and vibrational spectroscopic properties of highly ordered pyrolytic graphite (HOPG) were determined before and after modification by anodization or pulsed laser irradiation. Both treatments greatly accelerated the heterogeneous electron transfer rate constants for the  $\text{Fe}(\text{CN})_6^{3-/4-}$  and dopamine redox systems on HOPG by approximately six orders of magnitude. At intermediate electrochemical pretreatment (ECP) potentials, a spatially heterogeneous surface resulted, with surface regions exhibiting the 1360/cm band being separated by tens of microns. The results clearly indicate that graphitic edge plane is necessary for fast electron transfer, and that the pretreatment procedures accelerate  $\text{K}^+$  by generating edge plane defects in the HOPG lattice. The mechanisms of defect generation for the two procedures appear very different, with ECP appearing to follow a nucleation process leading to a spatially heterogeneous surface, while the laser pulse appears to shatter the HOPG lattice, leading to a more uniform distribution of active sites. The results provide important conclusions about the relationship between carbon electrode microstructure and heterogeneous electron transfer activity. Of particular

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interest is the heterogeneous electron transfer rate between carbon electrodes and various well-known redox systems such as ascorbic acid, ferri/ferrocyanide, and the catecholamines. Not only are these systems of significant analytical interest, but they serve as benchmarks for comparisons of electrode performance. Keywords: Electrodes; Reprints. (kt)

DESCRIPTORS: (U) \*ELECTROCHEMISTRY, \*ELECTRODES, \*ELECTRON TRANSFER, ACTIVATION, ANODIC COATINGS, ASCORBIC ACID, CARBON, CATECHOLAMINES, DEFECTS(MATERIALS), DISTRIBUTION, DOPAMINE, EDGES, GRAPHITE, HETEROGENEITY, HIGH RATE, IRRADIATION, MICROSTRUCTURE, MODIFICATION, NUCLEATION, OXIDATION REDUCTION REACTIONS, PERFORMANCE(ENGINEERING), PHYSICAL PROPERTIES, PULSED LASERS, RATES, REGIONS, REPRINTS, SITES, SPECTROSCOPY, STANDARDS, SURFACES, VIBRATION.

IDENTIFIERS: (U) WUAFDSR2303A1, PE61102F.

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OHIO STATE UNIV COLUMBUS DEPT OF CHEMISTRY

DESCRIPTORS: (U) \*ACTIVATION, \*CARBON, \*ELECTRODES, DENSITY, EDGES, ELECTROCHEMISTRY, ELECTRON TRANSFER, GRAPHITE, HETEROGENEITY, LASERS, MICROSTRUCTURE, OXIDATION, OXIDES, OXYGEN, RAMAN SPECTROSCOPY, RATES, REACTION KINETICS, REPRINTS.

(U) Mechanism of Electrochemical Activation of Carbon Electrodes: Role of Graphite Lattice Defects.

89

IDENTIFIERS: (U) WUAFOSR2303A1, PE61102F.

PERSONAL AUTHORS: Bowling, Robert J.; Packard, Richard T.; McCreery, Richard L.

CONTRACT NO. AFOSR-88-0071

PROJECT NO. 2303

TASK NO. A1

MONITOR: AFOSR  
TR-89-1148

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Langmuir, v5 n3 p683-688 1989.

ABSTRACT: (U) By use of Raman spectroscopy as a probe, the relationship between carbon microstructure and increases in the heterogeneous electron-transfer rate for carbon electrodes was examined. A distinctive Raman band at  $1360\text{ cm}^{-1}$  is proportional to the density of graphitic edge planes and may be used to monitor changes in edge plane density induced by carbon pretreatment procedures. It was shown that electrochemical oxidation of highly ordered pyrolytic graphite (HOPG) caused fracturing of the graphite lattice, thus increasing edge plane density. This result is consistent with other reports from laser activation of HOPG, which correlate increased edge plane density with increased electron-transfer rate. Creation of edge plane is a phenomenon common to both oxidative and nonoxidative activation procedures and is responsible for HOPG activation. Arguments about the involvement of graphitic oxide or oxygen containing functional groups in electron-transfer activation are presented. After the present results are combined with those from the literature, it appears unlikely the oxygen functional groups are involved in electron-transfer activation of several benchmark redox systems on carbon electrodes. Keywords: Reaction kinetics; Electrochemistry; Electrodes; Carbon; Reprints. (kt)

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DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVI09K

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DARTMOUTH COLL HANOVER N H DEPT OF CHEMISTRY

(U) Synthesis and Chemistry of Strained and Conjugated Fluorocarbons.

DESCRIPTIVE NOTE: Final rept. 1 Apr 86-31 Mar 89.

JUL 89

PERSONAL AUTHORS: Lemal, D. M.

CONTRACT NO. AFOSR-86-0130

PROJECT NO. 2303

TASK NO. B2

MONITOR: AFOSR  
TR-89-1098

UNCLASSIFIED REPORT

ABSTRACT: (U) The objective of this project was to synthesize and study the chemistry of an array of fluorocarbons and fluorocarbon derivatives in order to further understanding of fluorine as substituent in organic chemistry. Target molecules, all of which incorporated conjugation and/or strain, were chosen on the basis of unusual and/or interesting structural features. This investigation has accomplished the synthesis of many new fluorocarbons and derived molecules, and has included exploration of new synthetic methodology in fluorocarbon chemistry, determination of thermodynamic and kinetic parameters for fluorocarbon valence isomerizations, study of negative hyperconjugation, and examination of mechanisms of fluorocarbon reactions. Much has been learned about how to synthesize perfluorinated annulenes and their relatives, and much information has been acquired about potential energy surfaces for fluorocarbon valence isomerizations. A study of rotational barriers in alpha-fluoramines has revealed that negative hyperconjugation can have powerful energetic consequences even in neutral molecules. Insights into fluorocarbon reaction mechanisms, both thermal and photochemical, have emerged from synthetic explorations as well as from explicitly mechanistic studies. Keywords: Fluorocarbons; Organic synthesis; Annulenes; Ring strain; Dynamic NMR; Valence isomers;

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Negative hyperconjugation; Thermodynamic parameters; Kinetic parameters; Reaction mechanisms. (KY)

DESCRIPTORS: (U) \*FLUORINATED HYDROCARBONS, \*CHEMICAL REACTIONS, ARRAYS, BARRIERS, CHEMISTRY, CYCLIC COMPOUNDS, FLUORINE, ISOMERS, KINETICS, METHODOLOGY, MOLECULES, NEUTRAL, ORGANIC CHEMISTRY, ORGANIC MATERIALS, PARAMETERS, POTENTIAL ENERGY, RESPONSE, ROTATION, SURFACES, SYNTHESIS(CHEMISTRY), TARGETS, THERMODYNAMICS, VALENCE.

IDENTIFIERS: (U) PEG1102F, WUAFOSR2303B2, \*Fluorocarbons.

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## DTIC REPORT BIBLIOGRAPHY

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WISCONSIN UNIV-MADISON DEPT OF CHEMISTRY

MINNESOTA UNIV ST PAUL

(U) Structures of Two Organosilyl Azides.

89

PERSONAL AUTHORS: Zigler, Steven S.; Haller, Kenneth J.;  
West, Robert; Gordon, Mark S.

CONTRACT NO. F49620-86-C-0010

PERSONAL AUTHORS: Bierlerman, Irving

PROJECT NO. 2303

CONTRACT NO. AFOSR-89-0232

TASK NO. B2

PROJECT NO. 2313

MONITOR: AFOSR  
TR-89-1173

TASK NO. A5

MONITOR: AFOSR  
TR-89-1090

## UNCLASSIFIED REPORT

## UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Organometallics, v8 p1656-1660 1989.

ABSTRACT: (U) X-ray crystal structures were determined for trimethylazidosilane (3) and 1, 1-dimethyl-2, 2-diphenyl-2-tert-butylazidosilane (4). The N1-N2 and N2-N3 bond lengths (pm) in both compounds are nearly equal, being 115.8 and 117.0 for 3 and 117.0 and 114.7 for 4, respectively. These silyl azides thus differ markedly from organic azides, in which N2-N3 is much shorter than N1-N2. Molecular orbital calculations predict N2-N3 to be 6 pm shorter than N1-N2 in trinitrosilane (5). The N-N-N angle is 173.7 degs for 3 and 174.9 degs for 4, in good agreement with the calculated value for 5. Reprints. (AW)

DESCRIPTORS: (U) \*AZIDES, \*CRYSTAL STRUCTURE, \*SILANES, \*ORGANIC COMPOUNDS, COMPUTATIONS, MOLECULAR ORBITALS, REPRINTS, X RAYS, PHENYL RADICALS, BUTYL RADICALS, NITRO RADICALS.

IDENTIFIERS: (U) PEG1102F, WUAFOSR2303B2, \*Organosilyl Azides, Trimethylazidosilane, Silane/Trimethylazido, Disilane/1-1-Dimethyl-2-2-Diphenyl-2-Tert-Butylazido, Trinitrosilane.

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(U) A Conference on Three-Dimensional Representation Held in University of Minnesota on 24-26 May 1989.

DESCRIPTIVE NOTE: Final rept. 1 Jan-31 Dec 89.

JUN 89

ABSTRACT: (U) This is the final report for a conference grant entitled: A conference on Three-Dimensional Representation. The two and one-half day conference was held at the University of Minn. on May 24-26, 1989 to evaluate the current status of problem associated with three-dimensional representations from current computational, psychological, developmental, and neurophysiological perspectives. Nineteen presentations were made spanning these approaches. One hundred sixty-six individuals attended the conference. Of 44 evaluations received, 75% rated the conference as excellent, 20% as good, and 5% as fair. None rated it poor. The report consists of the original and revised program, conference abstracts evaluation summary and the roster of attendees. Keywords: Depth perception; Binocular space perception; Three dimensional; Visual motion; Object recognition; Parallel processing; Depth cues; Occlusion. (KR)

DESCRIPTORS: (U) \*SPACE PERCEPTION, \*VISUAL PERCEPTION, \*THREE DIMENSIONAL, ABSTRACTS, BINOCULARS, MINNESOTA, MOTION, OPTICAL IMAGES, PARALLEL PROCESSING, RECOGNITION, SYMPOSIA, TEST AND EVALUATION.

IDENTIFIERS: (U) PEG1102F, WUAFOSR2313A5.

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WASHINGTON UNIV SEATTLE DEPT OF PSYCHOLOGY

(U) Metacognition and Retrieval from Long-Term Memory at Mount Everest.

ALCOHOLS, BEHAVIOR, FEAR, FINLAND, HYPOXIA, INTOXICATION, JUDGEMENT(PSYCHOLOGY), MOUNTAINS, MOUNTS, PATTERNS, PICTURES, RETENTION(PSYCHOLOGY).

DESCRIPTIVE NOTE: Final rept. 13 May 88-23 Jun 89,

IDENTIFIERS: (U) PEG1102F, WJAFOSR2313A4.

JUN 89

PERSONAL AUTHORS: Nelson, Thomas O.

CONTRACT NO. AFOSR-88-0226

PROJECT NO. 2313

TASK NO. A4

MONITOR: AFOSR  
TR-89-1113

#### UNCLASSIFIED REPORT

**ABSTRACT:** (U) Behavioral data were collected from climbers at various altitudes on Mount Everest. In contrast to earlier findings that altitude impairs the acquisition of information into memory, we found no changes in the accuracy or latency of retrieving information from memory, even at extreme altitudes above 21,000' (8,400 m). This lack of effect on retrieval occurred for both the recall and recognition of answers to general-information questions (e.g., What is the capital of Finland?). Self-confidence about the accuracy of recent retrieval was also not affected by altitude. However, the feeling of knowing (i.e., self-confidence about upcoming retrieval) declined at extreme altitudes and remained lower even after return to Kathmandu. This pattern of results is close to opposite of the pattern obtained when the independent variable is alcohol intoxication and the same test battery is employed. These and related results are described in an attempt to give a relatively comprehensive picture of the climbers' performance, and suggestions are offered for future research. **Keywords:** Cognition, Memory, Metacognition, Judgment, Hypoxia, Fear, Danger, Mountaineering, Retrieval, Confidence, Altitude. (SDW)

**DESCRIPTORS:** (U) \*ALTITUDE, \*COGNITION, \*MEMORY(PSYCHOLOGY), \*CLIMBING, ACCURACY, ACQUISITION,

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STANFORD UNIV CA

(U) State-Resolved Reaction Dynamics.

DESCRIPTIVE NOTE: Final rept. 1 Nov 85-31 Oct 88,

JUL 89

PERSONAL AUTHORS: Zare, Richard N.

CONTRACT NO. F49620-88-C-0016

PROJECT NO. 2303

TASK NO. B1

MONITOR: AFOSR  
TR-89-1060

UNCLASSIFIED REPORT

ABSTRACT: (U) Resonance-Enhanced Multiphoton Ionization-Photoelectron Spectroscopy. A single time-of-flight (TOF) photoelectron spectrometer is to be used in conjunction with the MPI of jet-cooled molecules. This apparatus will measure energy and single-resolved photoelectron spectra. Such information has been of direct use in measuring the internal state distribution of REMPI-formed ions used in ion-molecule reaction studies. REMPI Spectroscopy of HBr and DBr. The laser induced fluorescence (LIF) technique has been developed to probe ion species. The ions produced directly from REMPI can have their rotational propensity roles in photoionization processes. The ions produced from a reaction between the state selected ions generated by REMPI and other molecules can be observed for studying state to state ion molecule reaction dynamics. State Selected Ion Molecule Reactions. The reactions of ammonia cations with neutral molecule, were conducted using a tandem quadrupole mass spectrometer. A new tapole ion trap was proposed to increase vastly our control over and understanding of biomolecular ion-molecular reactions. To make the quadrupole/octapole/quadrupole ion trap operational it was necessary to solve the technically challenging problem of interfacing three dissimilar radio frequency (rf) devices. (jhd)

DESCRIPTORS: (U) \*MASS SPECTROMETERS, \*PHOTOIONIZATION, AMMONIA, BIOMOLECULES, CATIONS, CHEMICAL REACTIONS,

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DISTRIBUTION, INTERNAL, ION BEAMS, ION ION INTERACTIONS, LASER INDUCED FLUORESCENCE, MOLECULAR BEAMS, MOLECULES, PHOTOELECTRIC EMISSION, RADIOFREQUENCY, SPECTROSCOPY, TIME, TRAPS.

IDENTIFIERS: (U) Multiphoton Ionization, Time of Flight, PEG1102F, WUAFOSR2303B1.

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DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVI09K

AD-A211 607 CONTINUED

VIRGINIA UNIV CHARLOTTEVILLE DEPT OF ELECTRICAL  
ENGINEERING

(U) SIS (Superconductor-Insulator-Superconductor) Mixer  
Research.

DESCRIPTIVE NOTE: Final Technical rept. Nov 87-Nov 88,

JUL 89

PERSONAL AUTHORS: Feldman, Marc J.

REPORT NO. UVA/525659/EE90/101

CONTRACT NO. AFOSR-86-0056

PROJECT NO. 2305

TASK NO. C3

MONITOR: AFOSR  
TR-89-1165

UNCLASSIFIED REPORT

ABSTRACT: (U) Theoretical and experimental research has been conducted to elucidate the basic physics behind the properties of superconductor-insulator-superconductor (SIS) tunnel junction receiving devices. The saturation behavior of the SIS mixer and the SIS direct detector was calculated. The direct detector was found to saturate at far higher powers than previously believed, allowing the possibility of practical application. SIS mixer saturation was measured using both monochromatic and thermal signals, and these experiments dramatically verified the theoretical expression. Quantum noise in the quantum theory of mixing was identified as the residual remaining when the usual noise sources are minimized. The quantum noise limit was shown to be reached in only two special cases. Computer calculations determined that the behavior of SIS receivers divides into two frequencies regimes, the cross-over frequency depending upon junction quality. The properties of these two regimes were delineated. A study of the role of the image termination of SIS mixers found that the nonlinear quantum reactance results in an effective time delay at the input port. Many aspects of the operation of SIS mixers at submillimeter wavelengths were clarified. Niobium nitride

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edge junctions with excellent current-voltage characteristics were fabricated using a novel barrier formation process. (rh)

DESCRIPTORS: (U) \*BARRIERS, \*DETECTORS, \*JUNCTIONS, \*MIXING, \*NOISE/ELECTRICAL AND ELECTROMAGNETIC), \*NONLINEAR SYSTEMS, \*QUANTUM ELECTRONICS, \*SATURATION, \*TUNNELING(ELECTRONICS), BEHAVIOR, COMPUTATIONS, COMPUTER APPLICATIONS, DELAY, EDGES, ELECTRIC CURRENT, FREQUENCY, IMAGES, INPUT, LIMITATIONS, NIOBIUM COMPOUNDS, NITRIDES, NOISE, PHYSICS, QUALITY, QUANTUM THEORY, REACTANCE, SOURCES, TIME INTERVALS, VOLTAGE.

IDENTIFIERS: (U) PE61102F, WUAFOSR2305C3.

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## DTIC REPORT BIBLIOGRAPHY

SEARCH CONTROL NO. EVI09K

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AD-A211 604 20/5

STANFORD UNIV CA DEPT OF MATHEMATICS

NORTH DAKOTA STATE UNIV FARGO DEPT OF CHEMISTRY

(U) Fast Reaction, Slow Diffusion, and Curve Shortening,

(U) Decomposition of Normal-Coordinate Vibrational Frequencies,

FEB 89

89

PERSONAL AUTHORS: Rubinstein, Jacob; Sternberg, Peter;  
Keller, Joseph B.

PERSONAL AUTHORS: Boatz, Jerry A.; Gordon, Mark S.

CONTRACT NO. AFOSR-88-0053

CONTRACT NO. AFOSR-87-0049, \$NSF-CHE83-09948

PROJECT NO. 2304

PROJECT NO. 2303

TASK NO. A4

TASK NO. B3

MONITOR: AFOSR  
TR-89-1178MONITOR: AFOSR  
TR-89-1171

UNCLASSIFIED REPORT

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Jnl. on Applied Mathematics,  
v49 n1 p116-133 Feb 89.SUPPLEMENTARY NOTE: Pub. in Jnl. of Physical Chemistry,  
v93 n5 p1817-1826 1989. Sponsored in part by Grants AFOSR-  
86-0237 and NSF-CHE85-11697.

ABSTRACT: (U) A reaction-diffusion problem for a vector is considered in a domain. An asymptotic solution is constructed for epsilon small. It shows that at each x, u tends quickly to a minimum of  $V(u)$ . When  $V$  has several minima,  $u$  tends to a piecewise constant function. Boundary layer expansions are constructed around the resulting surface of discontinuity or fronts. Each front is found to move along its normal with a constant velocity determined by the discontinuity  $V$  in  $V$  across it. When  $V=0$ , the front normal velocity is epsilon  $k$ , where  $k$  is its mean curvature. The motion of fronts in this manner is studied for arcs in the plane which are normal to omega at their endpoints, and for fronts that are closed curves. It is shown a front can shrink to a point in a finite time or tend to a locally shortest diameter of omega. In the latter case, a nonconstant steady state  $u(x, y, \epsilon)$  yields results. Keywords: Reprint. (KR)

DESCRIPTORS: (U) \*VECTOR ANALYSIS, ASYMPTOTIC SERIES, CURVATURE, DIFFUSION, DISCONTINUITIES, GRAPHS, MEAN, QUICK REACTION, REPRINTS, SURFACES, TIME, VELOCITY.

IDENTIFIERS: (U) PE61102F, WUAFOSR2304A4.

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DESCRIPTORS: (U) \*FREQUENCY, \*MOLECULAR STRUCTURE, CHEMICAL BONDS, COORDINATES, CYCLOALKANES, DECOMPOSITION, HARMONICS, HYDRIDES, INTERNAL, MOLECULAR VIBRATION, MOLECULE MOLECULE INTERACTIONS, REPRINTS, VIBRATION.

IDENTIFIERS: (U) PE61102F, WUAFOSR2303B3

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## DTIC REPORT BIBLIOGRAPHY

SEARCH CONTROL NO. EVI09K

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AD-A211 602

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OHIO STATE UNIV COLUMBUS DEPT OF CHEMISTRY

MASSACHUSETTS INST OF TECH CAMBRIDGE DEPT OF CHEMISTRY

(U) Raman Spectroscopy of Carbon Electrodes: Correlation between Defect Density and Heterogeneous Electron Transfer Rate.

JUN 88

PERSONAL AUTHORS: Bowling, Robert; Packard, Richard; McCreedy, Richard L.

MAY 89

PERSONAL AUTHORS: Jonas, David M.

CONTRACT NO. AFOSR-88-0071

CONTRACT NO. AFOSR-88-0062

PROJECT NO. 2303

PROJECT NO. 2303

TASK NO. A1

TASK NO. B1

MONITOR: AFOSR

MONITOR: AFOSR  
TR-89-1163

TR-89-1148

## UNCLASSIFIED REPORT

## UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in the Electrochemical Society, v135 n6 p1605-1606 Jun 88.

SUPPLEMENTARY NOTE: Pub. in Jnl. of Chemical Physics, v90 n10 p5563-5565, 15 May 1989.

ABSTRACT: (U) This communication discusses a specific observation related to the general question of what factors affect the heterogeneous electron transfer rate,  $k$ , at carbon electrodes. We report a correlation between the presence of defects on highly ordered pyrolytic graphite (HOPG) and the  $k$  value observed for ferri/ferrocyanide on electrochemically and laser pretreated HOPG surfaces. Keywords: Raman spectroscopy; Carbon electrodes. (jes)

ABSTRACT: (U) In Quantum Mechanics, Landau and Lifschitz derive a formula for the direct calculation of rovibronic statistical weights. If it were correct, this formula would dramatically reduce the effort necessary to calculate statistical weights in large molecules. Unfortunately, due to a common misapplication of the Pauli principle, the formula derived is incorrect, as are the subsequent examples and problem solutions. The correct formula derived in this paper is used to calculate statistical weights for hydrogen, ethylene, and ammonia which agree with those of Herzberg, Townes and Schawlow, and Bunker. Reprints. (JHD)

DESCRIPTORS: (U) \*ELECTRODES, \*ELECTRON TRANSFER, \*RAMAN SPECTROSCOPY, CARBON, DENSITY, HETEROGENEITY, LASERS, OBSERVATION, RATES, SPECTROSCOPY.

DESCRIPTORS: (U) \*QUANTUM THEORY, AMMONIA, COMPUTATIONS, ETHYLENE, FORTIFICATIONS, HYDROGEN, MOLECULAR VIBRATION, PROBLEM SOLVING, REPRINTS, SPIN STATES, STATISTICS.

IDENTIFIERS: (U) PE61102F, WUAFOSR2303A1

IDENTIFIERS: (U) PE61102F, WUAFOSR2303B1.

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TEXAS UNIV AT AUSTIN DEPT OF CHEMISTRY

TEXAS UNIV AT AUSTIN DEPT OF CHEMISTRY

(U) Synthesis of Perfluoro Crown Ethers: A New Class of Cyclic Fluorocarbons.

(U) Synthesis of Perfluorotetraalkyl Orthocarbonates Using Elemental Fluorine.

88

89

PERSONAL AUTHORS: Lin, Wen-Huey; Bailey, Webb I, Jr.; Lagow, Richard J.

PERSONAL AUTHORS: Lin, Wen-Huey; Clark, Wayne D.; Lagow, Richard J.

CONTRACT NO. AFOSR-87-0016, \$AFOSR-82-0197

CONTRACT NO. AFOSR-88-0084, NAG3-602

PROJECT NO. 2303

PROJECT NO. 2303

TASK NO. B2

TASK NO. B2

MONITOR: AFOSR  
TR-89-1152MONITOR: AFOSR  
TR-89-1156

UNCLASSIFIED REPORT

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Pure and Applied Chemistry, v60 n4 p473-476 1988.

SUPPLEMENTARY NOTE: Pub. in Jnl. of Organic Chemistry, v54 n8 p1990-1992 1989.

ABSTRACT: (U) The first perfluoro crown ethers, perfluoro-18-crown-6, perfluoro 15-crown-5 and perfluoro 12-crown-4, have been prepared by carefully controlled elemental fluorination. Although they are weaker bases, crown ethers are materials which will have a number of applications. Keywords: Fluorine compounds; Fluorocarbons; Reprints; Synthesis chemistry; Ethers; Fluorination; chemical stability. (KT)

ABSTRACT: (U) An extraordinarily significant application of direct fluorination is in the synthesis of oxygen-containing fluorocarbons that are inaccessible by other techniques. Thus, recent research on the synthesis of 'spherical' fluorocarbons in our laboratory has led to the preparation of perfluorotetraalkyl orthocarbonates C10CRf14 by controlled direct elemental fluorine reactions. Hydrocarbon orthocarbonates are generally synthesized by the action of sodium alkoxides on trichloronitromethane or trichloromethanesulfonyl chloride. Perfluorotetraalkyl orthocarbonates are inaccessible via conventional fluorooorganic techniques. While fluorinated alkoxides are known, they are very weak nucleophiles and, at the temperatures required for reaction, are highly dissociated or undergo competing side reactions. Reprints. (kr)

DESCRIPTORS: (U) \*CYCLIC COMPOUNDS, \*ETHERS, \*FLUORINATED HYDROCARBONS, \*SYNTHESIS(CHEMISTRY), CHEMICALS, FLUORINATION, FLUORINE COMPOUNDS, REPRINTS, STABILITY, SYNTHESIS.

IDENTIFIERS: (U) PEG1102F, WUAFOSR2303B2, \*perfluoro Crown Ethers

DESCRIPTORS: (U) \*SYNTHESIS(CHEMISTRY), \*CARBONATES, \*FLUORINE, ALKOXY RADICALS, CHLORIDES, FLUORINATION, LOW STRENGTH, REPRINTS, SIDE REACTIONS, SODIUM, SYNTHESIS.

IDENTIFIERS: (U) PEG1102F, WUAFOSR2303B2, \*Perfluorotetraalkyl Orthocarbonates.

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DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVI09K

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CALIFORNIA INST OF TECH PASADENA

(U) Stress Wave Induced Damage in Rock.

DESCRIPTIVE NOTE: Final rept. 15 Apr 88-14 Mar 89.

JUN 89

PERSONAL AUTHORS: Rubin, Allan M.; Arhens, Thomas J.

CONTRACT NO. AFOSR-88-0134

PROJECT NO. 2302

TASK NO. C2

MONITOR AFOSR  
TR-89-1101

UNCLASSIFIED REPORT

ABSTRACT: (U) Blocks of San Marcos Gabbro and Bedford Limestone were impacted with high-velocity projectiles and longitudinal elastic velocity measurements were carried out on oriented cubes throughout a cross-section of each block. For both rock types the velocity increases rather uniformly with distance from the impact site, reaching the unshocked velocity at a distance of approximately 1 crater radius. The maximum observed velocity reduction is to slightly < half the unshocked seismic velocity for both gabbro and limestone(l.s); however, the average velocity reduction within the damaged zone is significantly greater for ls. Observed anisotropy in velocity reduction in the gabbro sample clearly can be related to the preferred orientation of macroscopic cracks, suggesting that velocity measurements can be a powerful tool for characterizing crack density and orientation in shocked rock. Microscopic observations of the gabbro indicate that both the number of cracks/unit area and crack size increase as seismic velocity decreases. Observational estimates of crack density are generally slightly lower than estimates made from theoretical consideration of observed velocity reduction. Microscopic observation of the porous ls indicates that both the percentage of fractured grains and their degree of comminution increase as seismic velocity decreases. Anisotropy of crack orientation and seismic velocity is less pronounced in the ls than in the gabbro, possibly

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because fracture growth is controlled by grain-grain contacts which tend to be distributed homogeneously. The peak dynamic pressures induced by the quasi-spherical shock waves reached maxima of about 0.97 GPa and 0.84 GPa in the gabbro and ls, respectively, immediately below the crater floor. (EDC)

DESCRIPTORS: (U) \*ROCK MECHANICS, \*CRACKS, \*FRACTURE(MECHANICS), \*LIMESTONE, \*STRESS WAVES, ANISOTROPY, COMMUNITION, CRATERS, DAMAGE, DENSITY, DYNAMIC PRESSURE, ELASTIC PROPERTIES, ESTIMATES, GRAIN SIZE, GROWTH(GENERAL), HIGH VELOCITY, IGNEOUS ROCK, IMPACT TESTS, LENGTH, MEASUREMENT, MICROSCOPY, OBSERVATION, ORIENTATION(DIRECTION), PEAK VALUES, POROSITY, PROJECTILES, RECTANGULAR BODIES, REDUCTION, SEISMIC WAVES, SHOCK WAVES, SITES, SIZES(DIMENSIONS), VELOCITY

IDENTIFIERS: (U) \*Gabbro, Shocked rock, Seismic velocity, PE61102F, WUAFOSR2302C2.

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DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EV109K

AD-A211 598 CONTINUED

Chloroaluminate.

AD-A211 598 11/3 20/3

STATE UNIV OF NEW YORK AT BUFFALO DEPT OF CHEMISTRY

(U) Aluminum Anodization in a Basic Ambient Temperature Molten Salt.

MAY 89

PERSONAL AUTHORS: Carlin, Richard T.; Osteryoung, Robert A.

CONTRACT NO. AFOSR-87-0088

PROJECT NO. 2303

TASK NO. B2

MONITOR: AFOSR  
TR-89-1078

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Jnl. of Electrochemical Society, v136 n5 May 89.

ABSTRACT: (U) Aluminum anodization has been studied in the basic  $\text{AlCl}_3$ :1-methyl-3-ethylimidazolium chloride ( $\text{ImCl}$ ) ambient temperature molten salt ( $\text{AlCl}_3$ : $\text{ImCl}$  molar ratio <1.0). The anodization process was studied as a function of chloride anion concentration. Two different anodization processes are observed. The more cathodic anodization involves formation of the tetrachloroaluminate anion and exhibits a limiting current controlled by diffusion of chloride to the electrode surface. The more anodic anodization shows no diffusion control. A value for the diffusion coefficient of chloride was obtained which is lower than previously reported; the difference involves using a value of 1, rather than 2/3. No reduction of the tetrachloroaluminate anion was observed even at elevated temperatures. Keywords: Chloroaluminates; Reprints; Anodizing. (kt)

DESCRIPTORS: (U) \*ALUMINUM, \*ANODIC COATINGS, ALUMINATES, ANIONS, CHLORIDES, CHLORINE COMPOUNDS, CONCENTRATION(CHEMISTRY), CONTROL, DIFFUSION, DIFFUSION COEFFICIENT, ELECTRODES, HIGH TEMPERATURE, LIMITATIONS, MELTS, REPRINTS, SALTS, SURFACES, TEMPERATURE.

IDENTIFIERS: (U) PE61102F, WUAFOSR2303B2, Anodizing.

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STATE UNIV OF NEW YORK AT BUFFALO DEPT OF CHEMISTRY

(U) Normal and Reverse Pulse Voltammetry from Poised Systems at Microdisk Electrodes,

8p

PERSONAL AUTHORS: Sinru, Lin; Osteryoung, Robert A.

CONTRACT NO. AFOSR-87-0088

PROJECT NO. 2303

TASK NO. B2

MONITOR: AFOSR  
TR-89-2084

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Analytical Chemistry, v60  
p1845-1850 1988.

ABSTRACT: (U) Electrodes with dimensions in the micrometer regime, so called ultramicroelectrodes, have been of considerable interest. The small area results in small IR drops for carrying out fast voltammetry, the small RC time constants should permit very rapid pulse voltammetry, and nonplanar diffusion permits operation in a steady-state and, at sufficiently short times, a transient regime. The current-time behavior for a chronoamperometric experiment to a potential on a diffusion plateau of a reaction at a disk embedded in a plane has been examined. Normal and reverse pulse voltammetry have been carried out at microdisk electrodes under conditions where the electrode is effectively in a poised medium. This is accomplished by initiating the experiments from a potential so that the surface concentrations of the oxidized and reduced species, ferri- and ferrocyanide, are both finite. Agreement between theory and experiment is shown to be excellent. Reprints. (AW)

DESCRIPTORS: (U) \*ELECTRODES, \*VOLTAMMETRY, \*SURFACE CHEMISTRY, \*CYANIDES, \*IRON COMPOUNDS, CONSTANTS, CURRENTS, DIFFUSION, MICROMETERS, NONPLANAR, OXIDATION, PULSES, REDUCTION(CHEMISTRY), REPRINTS, REVERSIBLE, SHORT RANGE(TIME), TIME, TRANSIENTS.

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IDENTIFIERS: (U) PE61102F, WUAFOSR230382, \*Microdisk Electrodes, Ultramicroelectrodes, Microelectrodes, Current Time Reactions, Chronoamperometrics, Ferri-ferrocyanide.



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## DTIC REPORT BIBLIOGRAPHY

SEARCH CONTROL NO. EVI09K

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IDAHO UNIV MOSCOW DEPT OF CHEMISTRY

WASHINGTON UNIV SEATTLE DEPT OF CHEMISTRY

(U) The Vibrational Spectrum of Tetrafluoropropyne.

89

PERSONAL AUTHORS: Friedrich, H. B.; Burton, Donald J.;  
Schenmer, Pamela A.

89

PERSONAL AUTHORS: Engstrom, J. R.; Nelson, Mark M.; Engel,  
Thomas

CONTRACT NO. AFOSR-87-0067, NSF-CHE87-12734

CONTRACT NO. AFOSR-87-0166

PROJECT NO. 2303

PROJECT NO. 2303

TASK NO. 82

TASK NO. A2

MONITOR: AFOSR  
TR-89-1088

MONITOR: AFOSR

TR-89-1167

UNCLASSIFIED REPORT

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. In Spectrochimica Acta, v45A  
p181-185 1989.SUPPLEMENTARY NOTE: Pub. In Surface Science, v215 p437-  
500 1989.

ABSTRACT: (U) The I.R. spectrum of gaseous tetrafluoropropyne has been measured from 4000 to 100/cm, and all of the observed bands have been assigned. The e mode frequencies of the trifluoromethane group are similar to those of other CF<sub>3</sub>CCX species, and even though the al modes are less regular, the variations can be explained without changes in force constants other than those involving the C-X bond. Several bands, particularly v<sub>1</sub> and combinations with v<sub>1</sub> show pronounced sequence structure due to excited levels of v<sub>10</sub>, the C-C-C skeletal bend. Reprints. (AW)

DESCRIPTORS: (U) \*VIBRATIONAL SPECTRA, \*FLUORINATED HYDROCARBONS, \*ACETYLENES, \*METHYL RADICALS, CONSTANTS, FLUORINE COMPOUNDS, FORCE(MECHANICS), FREQUENCY, METHANE, REPRINTS, SEQUENCES, MOLECULAR VIBRATION, INFRARED SPECTRA, VAPOR PHASES, MOLECULAR STRUCTURE.

IDENTIFIERS: (U) PE61102F, WUAFOSR2303B2,  
\*Tetrafluoropropyne, Trifluoromethane.

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ABSTRACT: (U) The adsorption of reaction of both molecular and atomic fluorine with the Si(100) surface has been examined under ultrahigh vacuum conditions with supersonic molecular beam techniques, X-ray photoelectron spectroscopy (XPS), quadrupole mass spectrometry and low energy ion scattering spectroscopy. Molecular fluorine adsorbs dissociatively on the clean Si(100) surface independent of both the incident beam energy and surface temperature. The coverage-exposure relationship for F<sub>2</sub> is characterized by an initial rapid phase of adsorption, followed by a much slower phase of adsorption. The adsorption of atomic fluorine is qualitatively different from molecular fluorine. Although the initial probability of adsorption is quite similar, the adsorption probability of atomic fluorine is only weakly dependent on coverage. We suggest that the spatially inhomogeneous decomposition is a manifestation of preferential reactivity at surface defects such as atomic steps. Investigation of the steady-state reaction between F<sub>2</sub> (g) and the Si(100) substrate for temperatures of 650 1200 K shows conclusively that fluorine must be adsorbed dissociatively for the gasification reaction. Keywords: Reprints. (kt)

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SEARCH CONTROL NO. EVI09K

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DESCRIPTORS: (U) \*ADSORPTION, \*FLUORINE, \*MASS SPECTROMETRY, \*MOLECULAR BEAMS, DEFECTS(MATERIALS), ENERGY, ENERGY CONVERSION, GASES, IONS, LOW ENERGY, MOLECULES, PROBABILITY, QUADRUPOLE MOMENT, REACTIVITIES, REPRINTS, RESPONSE, SCATTERING, SPECTROSCOPY, STEADY STATE, SUPERSONIC CHARACTERISTICS, SURFACE TEMPERATURE, SURFACES, ULTRAHIGH VACUUM, X RAY PHOTOELECTRON SPECTROSCOPY.

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FLORIDA UNIV GAINESVILLE DEPT OF INDUSTRIAL AND SYSTEMS ENGINEERING

(U) Aircraft Sortie Effectiveness Model, 89

PERSONAL AUTHORS: Sivazlian, Boghos D.

IDENTIFIERS: (U) PE61102F, WUAF0SR2303A2.

CONTRACT NO. F49620-85-C-0013

PROJECT NO. 3396

TASK NO. D5

MONITOR: AFOSR  
TR-89-1099

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Naval Research Logistics, v36 p127-137 1989.

ABSTRACT: (U) A mathematical model describing the sortie of a single aircraft under enemy threats, attacking a single passive target, is developed. Emphasis is placed on the determination of the probabilities associated with the various events in the sortie. These probabilities are then used to derive appropriate measures of effectiveness. The optimum sortie time is analyzed. In this document the author develops a methodology for modeling mathematically and aircraft sortie in order to arrive at various measures of effectiveness to evaluate the sortie. The stochastic model, which is similar to a Lancaster-type model, considers only a single aircraft attacking a single passive target. The analytical expressions obtained incorporate several useful input parameters reflecting both aircraft attrition and target kill. The results are used to arrive at an optimum sortie time which maximizes a gain function. Keywords: Reprints. (KR)

DESCRIPTORS: (U) \*ATTACK AIRCRAFT, \*AIRCRAFT MODELS, \*MATHEMATICAL MODELS, \*MISSIONS, \*STOCHASTIC PROCESSES, \*ATTRITION, \*DETERMINATION, ENEMY, GAIN, INPUT, KILL PROBABILITIES, MATHEMATICAL ANALYSIS, OPERATIONAL EFFECTIVENESS, PARAMETERS, PASSIVE SYSTEMS, PROBABILITY, COMBAT EFFECTIVENESS, REPRINTS, TARGETS, THREATS.

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IDENTIFIERS: (U) PEG1102F, WUAFO5R3396D5, \*Sorties.

CENTRAL INST FOR THE DEAF ST LOUIS MO

(U) Binaural Masking: An Analysis of Models.

DESCRIPTIVE NOTE: Final technical rept. 15 Jul 86-14 Mar 89,

AUG 89

PERSONAL AUTHORS: Gilkey, Robert H.

CONTRACT NO. AFOSR-86-0298

PROJECT NO. 2313

TASK NO. A6

MONITOR: AFOSR  
TR-89-1164

UNCLASSIFIED REPORT

ABSTRACT: (U) The overall goal of this program of research is to specify the processes used by the auditory system to detect signals presented in noisy backgrounds. A wide variety of experimental approaches were used to examine these processes. The data suggest that subjects often detect the signal as a change in the spectral/temporal pattern of stimulus information. These results conflict with the classical models of simple auditory masking that suggest that subjects restrict their analysis to a narrow frequency band and a brief temporal window. Quantitative models of the process that compares information across spectral/temporal regions were developed, which combine excitatory and inhibitory components. While it has traditionally been assumed that quite different mechanisms govern monaural and binaural masking phenomena, very similar models were successfully applied to the two sets of data. Other significant results include a more complete description on internal noise processes, evidence that the external masker is not cancelled by the binaural processor, empirical and theoretical evaluations of the efficiency of psychophysical procedures, and hardware and software developments to aid psychacoustic research. Overall, the work examined issues and models of contemporary interest and thus has implications for auditory theory in general and for the study of auditory pattern analysis and

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auditory masking in specific. (AW)

TEXAS UNIV AT AUSTIN DEPT OF CHEMISTRY

DESCRIPTORS: (U) \*AUDITORY SIGNALS, \*MASKING, \*AUDITORY PERCEPTION, \*BACKGROUND NOISE, COMPUTER PROGRAMS, CONFLICT, FREQUENCY BANDS, HEARING, INHIBITION, INTERNAL, MODELS, NARROWBAND, NOISE, PSYCHOACOUSTICS, PSYCHOPHYSICS, STIMULI, TEST AND EVALUATION, THEORY, SIGNAL PROCESSING.

(U) Synthesis of Unusual Perfluorocarbon Ethers and Amines Containing Bulky Fluorocarbon Groups: New Biomedical Materials,

88

IDENTIFIERS: (U) PEG1102F, WUAFOSR2313A6, \*Binaural Masking, Spectral Temporal Patterns, Auditory Masking, Temporal Windows, Internal Noise, Psychoacoustics, Auditory Pattern Analysis.

PERSONAL AUTHORS: Huang, Hsu-Nan; Persico, Daniel F.; Lagow, Richard J.; Clark, Leland C., Jr

CONTRACT NO. AFOSR-82-0197

PROJECT NO. 2303

TASK NO. B2

MONITOR: AFOSR  
TR-89-1157

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Jnl. of Organic Chemistry, v53 n1 p78-85 1988.

ABSTRACT: (U) The reactions of elemental fluorine with structurally crowded hydrocarbon ethers and amines have been studied. The perfluorinated products are currently of interest in biomedical or electronic industrial applications. The 19F and 13C(19F) (19F decoupled) NMR assignments are also discussed. Keywords: Reaction kinetics; Synthesis chemistry; Nuclear magnetic resonance; Perfluorocarbon ethers; Fluorocarbons; Direct fluorination; Elemental fluorine; Fluorine compounds. Reprints. (KT)

DESCRIPTORS: (U) \*AMINES, \*ETHERS, \*FLUORINATED HYDROCARBONS, \*FLUORINE COMPOUNDS, BIOMEDICINE, ELECTRONICS, FLUORINATION, HYDROCARBONS, INDUSTRIES, NUCLEAR MAGNETIC RESONANCE, REACTION KINETICS, REPRINTS, SYNTHESIS, SYNTHESIS(CHEMISTRY).

IDENTIFIERS: (U) PEG1102F, WUAFOSR2303B2, \*Perfluorocarbon Ethers.

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NORTH DAKOTA STATE UNIV FARGO DEPT OF CHEMISTRY

IDENTIFIERS: (U) PEG1102F, WUAFOSR230383

(U) Heats of Formation of Alkylsilanes,

89 4P

PERSONAL AUTHORS: Gordon, Mark S.; Boatz, J. A.; Walsh, Robin

CONTRACT NO. AFOSR-87-0049, NSF-CHE86-40771

PROJECT NO. 2303

TASK NO. B3

MONITOR: AFOSR  
TR-89-1175

UNCLASSIFIED REPORT

Availability: Document partially illegible.

SUPPLEMENTARY NOTE: Pub. in Jnl. of Physical Chemistry, v93 n4 p1584-1585 1989.

ABSTRACT: (U) Theoretical heats of formation at 298 K for several alkylsilanes, predicted at the MP2/6-31G(d) level of theory, are compared with recently obtained experimental and additivity values. Excellent agreement is obtained between the ab initio and additivity values and with the more reliable experimental values for acyclic alkylsilanes. The ab initio heats of formation for the silacycloalkanes permits the evaluation of strain energy increments for the additivity scheme. Comparison is made with limited experimental data. In a recent paper the heats of formation for several cyclic and acyclic alkylsilanes were predicted by using computer energy differences for appropriate homodesmic reactions. The heats of formation were obtained by first calculating energy differences for the homodesmic reactions using second-order many-body perturbation theory (MP2) 3 and the 6-31G(d) basis set at the self-consistent field (SCF) geometries. Reprints. (JES)

DESCRIPTORS: (U) \*HEAT OF FORMATION, COMPUTATIONS, COMPUTERS, CONSISTENCY, ENERGY, EXPERIMENTAL DATA, RELIABILITY, REPRINTS, VALUE.

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INSTITUTE FOR COMPUTER APPLICATIONS IN SCIENCE AND  
ENGINEERING HAMPTON VA

INSTITUTE FOR COMPUTER APPLICATIONS IN SCIENCE AND  
ENGINEERING HAMPTON VA

(U) Fourier Analysis of the SOR Iteration.

(U) Multiprocessor Sparse L/U Decomposition with  
Controlled Fill-In.

DESCRIPTIVE NOTE: Final rept. 1 Jun 85-31 Aug 87,

DESCRIPTIVE NOTE: Final rept. 1 Jun 85-31 Aug 87,

SEP 86

OCT 85

PERSONAL AUTHORS: LeVeque, Randall J.; Trefethen, Lloyd N.

PERSONAL AUTHORS: Alaghband, Gita; Jordan, Harry F.

REPORT NO. ICASE-86-63

REPORT NO. ICASE-85-48

CONTRACT NO. NAS1-18107, \$AFOSR-85-0189

CONTRACT NO. NAS1-17070, \$AFOSR-85-0189

PROJECT NO. 2304

PROJECT NO. 2304

TASK NO. A3

TASK NO. A3

MONITOR: AFOSR  
TR-89-1130

MONITOR: AFOSR

TR-89-1111

UNCLASSIFIED REPORT

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Supported in part by grants NSF-DMS86-01363, NSF-DMS85-0470 and NAS1-18107.

ABSTRACT: (U) During L/U decomposition of a sparse matrix, it is possible to perform computation on many diagonal elements simultaneously. Pivots that can be processed in parallel are related by a compatibility relation and are grouped in a compatible set. The collection of all maximal compatibles yields different maximum sized sets of pivots that can be processed in parallel. Generation of the maximal compatibles is based on the information obtained from an incompatible table. This table provides information about pairs of incompatibles pivots. In this paper, generation of the maximal compatibles of pivot elements for a class of small sparse matrices is studied first. The algorithm involve a binary tree search and has a complexity exponential in the order of the matrix. Different strategies for selection of a set of compatible pivots based on the Markowitz criterion are investigated. The competing issues of parallelism and fill-in generation are studied and results are provided. A technique for obtaining an ordered compatible set directly from the ordered incompatible table is given. This technique generates a set of compatible pivots with the property of generating few fills. A new heuristic algorithm is then

ABSTRACT: (U) The SOR iteration for solving linear systems of equations depends upon an overrelaxation factor omega. We show that for the standard model problem of Poisson's equation on a rectangle, the optimal omega and corresponding convergence rate can be rigorously obtained by Fourier analysis. The trick is to tilt the space-time grid so that the SOR Successive overrelaxation stencil becomes symmetrical. The tilted grid also gives insight into the relation between convergence rates of several variants. Keywords: Successive overrelaxation. Iterative methods. (KR)

DESCRIPTORS: (U) \*FOURIER ANALYSIS, \*ITERATIONS, CONVERGENCE, GRIDS, EQUATIONS, RATES, SPACE PERCEPTION, TILT, TIME, VARIATIONS.

IDENTIFIERS: (U) PE61102F, WUAFOSR2304A3, SOR(Successive Overrelaxation)

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proposed that combines the idea of an ordered compatible set with a limited binary tree search to generate several sets of compatible pivots in linear time. Finally, an elimination set to reduce the matrix is selected. (KR)

DESCRIPTORS: (U) \*PARALLEL PROCESSING, \*COMPUTATIONS, \*SPARSE MATRIX, ALGORITHMS, ELIMINATION, PIVOTS, SEARCHING, TIME, TREES.

IDENTIFIERS: (U) PE81102F, WJAFOSR2304A3.

AD-A211 565 20/11

CALIFORNIA INST OF TECH PASADENA GRADUATE AERONAUTICAL LABS

(U) An Experimental and Analytical Program to Develop Crack Tip Fracture Criteria.

DESCRIPTIVE NOTE: Final rept. 1 Sep 84-31 Oct 88,

JUL 89

PERSONAL AUTHORS: Schultheisz, C. R.; Knauss, W. G.

CONTRACT NO. AFOSR-84-0254

PROJECT NO. 2302

TASK NO. B2

MONITOR: AFOSR  
TR-89-1181

UNCLASSIFIED REPORT

ABSTRACT: (U) The large plastic deformations at the tip of a crack in a ductile heat treatment of 4340 steel are studied numerically and experimentally. The numerical simulation of the experiment uses a small strain, incremental plasticity law, with a power law hardening behavior. Both the inplane and out-plane deformations are measured on the same specimen at the same time. The experimental technique of moire interferometry is used to measure the in-plane displacements. This technique is described in detail, including an analysis of the effort of out-of-plane rotations on the use of the technique. A three beam interferometer and a four beam interferometer are compared. The out-of-plane displacements are measured with a Twyman-Green interferometer. The analysis of this data is still underway and will be forward when completed. The numerical model is described in detail. The material properties are determined from a uniaxial test on specimens taken from the same bar as the fracture specimens and with identical heat treatment. A numerical model of the fracture specimen having 7581 degrees of freedom is used to provide data for comparison between 400 N (linear behavior) up to 75000 N (catastrophic failure of the steel specimen) in fourteen steps. (JES)

DESCRIPTORS: (U) , AXES, CATASTROPHIC CONDITIONS, CRACKS.

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DISPLACEMENT, DUCTILITY, FAILURE, FRACTURE(MECHANICS),  
HARDENING, HEAT TREATMENT, INTERFEROMETERS,  
INTERFEROMETRY, LABORATORY PROCEDURES, LINEARITY,  
MATHEMATICAL ANALYSIS, MATHEMATICAL MODELS, MOIRE EFFECTS,  
NUMERICAL ANALYSIS, PLASTIC DEFORMATION, PLASTIC  
PROPERTIES, POWER, ROTATION.

MASSACHUSETTS INST OF TECH CAMBRIDGE

(U) Laser Fluorescence Excitation Band Profiles of Jet-  
Cooled Tropolone.

89

IDENTIFIERS: (U) PE61102F, WUAFOSR2302B2.

PERSONAL AUTHORS: Redington, Richard L.; Field, Robert W.

CONTRACT NO. AFOSR-88-0062

PROJECT NO. 2303

TASK NO. B1

MONITOR: AFOSR  
TR-89-1162

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Spectrochimica Acta, v45A n1  
p41-46 1989.

ABSTRACT: (U) Spectroscopic studies demonstrating  
resolved tunneling doublets suggest that tropolone is a  
molecule highly suited for investigating the  
participation of remote heavy atoms in the OH ... O  
tunneling process. Fluorescence excitation band profiles  
and relative emission intensities complement tunneling  
doublets and other spectroscopic information useful for  
the analysis of intramolecular dynamics. This type of  
data is particularly useful for considerations of the  
vibronic couplings, nonradiative relaxation processes,  
and photochemical dissociation that appear in the  
previous studies of tropolone. Therefore, in this article  
we report our initial observations of laser fluorescence  
excitation transitions of the system of jet-cooled  
tropolone investigated as a function of the laser  
intensity. Reprints. (kt)

DESCRIPTORS: (U) \*LASER INDUCED FLUORESCENCE, \*BAND  
SPECTRA, COUPLINGS, DISSOCIATION, EXCITATION, INTENSITY,  
LASERS, PHOTOCHEMICAL REACTIONS, RELAXATION, REPRINTS,  
SPECTROSCOPY, TRANSITIONS, TUNNELING, VIBRATION.

IDENTIFIERS: (U) PE61102F, WUAFOSR2303B1, \*Tropolone.

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HUGHES RESEARCH LABS MALIBU CA

(U) Plasma-Anode Electron Gun Research.

DESCRIPTIVE NOTE: Final rept. 15 Jul 86-15 Feb 89.

MAY 89

PERSONAL AUTHORS: Schumacher, Robert W.; Santoru, Joseph

CONTRACT NO. F49620-88-C-0105

PROJECT NO. 2301

TASK NO. A8

MONITOR: AFOSR  
TR-89-1190

## UNCLASSIFIED REPORT

ABSTRACT: (U) The plasma-anode electron gun (PAG) is a new cold-cathode electron source which exhibits many novel features. These include instant starting, no cathode heater power, minimal vacuum requirements, a nonpoisoning cathode, long-pulse operation without gap closure, and beam modulation at ground potential with constant beam energy. The basic concept involves a collective interaction between counterpropagating streams of electrons and ions in a high-voltage diode gap. A Pierce electron-gun configuration is employed, but the thermionic cathode is replaced with a cold, secondary-electron-emitting electrode. Electron emission is stimulated by bombarding the cathode with high-energy ions. The ions are injected into the high-voltage gap through a gridded structure from a plasma source, which is embedded inside the anode electrode. The gridded structure serves as both a cathode for the plasma discharge and as an anode for the PAG. As high-voltage ions impact the cathode surface, secondary electrons are emitted, accelerated back through the diode gap, and focused through an on-axis aperture in the anode. Under this program, a modified Herrmannsfeldt computer code was constructed that calculates electron and ion trajectories and limiting particle currents in realistic geometries in the self-consistent space-charge fields of both particle species. (RH)

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DESCRIPTORS: (U) \*ANODES, \*COLD CATHODE TUBES, \*ELECTRON EMISSION, \*ELECTRON GUNS, \*GRIDS, \*HEATERS, \*PARTICLE TRAJECTORIES, \*PLASMA JETS, \*SECONDARY EMISSION, \*THERMIONIC EMISSION, CATHODES, COMPUTER PROGRAMS, CONFIGURATIONS, CONSISTENCY, CURRENTS, ELECTRODES, ELECTRONS, ENERGY, GROUND LEVEL, HIGH ENERGY, HIGH VOLTAGE, IMPACT, INTERACTIONS, IONS, LIMITATIONS, MODULATION, PARTICLES, PLASMAS(PHYSICS), POWER, PROPAGATION, REQUIREMENTS, SOURCES, SPACE CHARGE, STARTING, STREAMS, SURFACES, VACUUM.

IDENTIFIERS: (U) PEG1102F, WUAFOSR2301A8.

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STATE UNIV OF NEW YORK AT BUFFALO DEPT OF CHEMISTRY

(U) The Ferro/Ferricyanide Couple in an Aluminum Chloride-1-Methyl-3-ethylimidazolium Chloride Ambient-Temperature Molten Salt.  
IDENTIFIERS: (U) WUAFOSR230382, PE61102F, \*Ferrocyanide, \*Ferricyanide.

DESCRIPTIVE NOTE: Interim rept. 1 Dec 86-30 Jun 89.

89

PERSONAL AUTHORS: Das, B.; Carlin, R.; Osteryoung, R. A.

CONTRACT NO. AFOSR-87-0088

PROJECT NO. 2303

TASK NO. B2

MONITOR: AFOSR  
TR-89-1079

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. In Inorganic Chemistry, v28 n3 p421-426 1989.

ABSTRACT: (U) Ambient-temperature molten salts consisting of  $AlCl_3$  and an organic chloride are of considerable interest as solvents for a variety of electrochemical and spectroscopic studies. One such solvent, aluminum chloride-1-methyl-3-ethylimidazolium chloride ( $AlCl_3$ -ImCl), is a liquid at room temperature over the composition range 33-67 mol%  $AlCl_3$ . The solvent shows Lewis acidity and basicity depending upon the  $AlCl_3$ :ImCl mole ratio. If the ratio is greater than, equal to or less than 1, the solvent is acidic, neutral, or basic, respectively. Electrochemical and spectroscopic studies of organic and inorganic solutes have been carried out in these solvents. Here we describe spectrochemical and electrochemical studies on the ferricyanide/ferrocyanide couple in the  $AlCl_3$ -ImCl molten salt solvent. Reprints. (kt)

DESCRIPTORS: (U) \*CHLORIDES, \*CYANIDES, \*MOLTEN SALTS, \*ALUMINUM COMPOUNDS, ACIDS, CHEMICAL ANALYSIS, ELECTROCHEMISTRY, INORGANIC MATERIALS, LIQUIDS, RATIOS, REPRINTS, ROOM TEMPERATURE, SOLUTES, SOLVENTS, SPECTROSCOPY, SPECTRUM ANALYSIS.

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PRINCETON UNIV NJ DEPT OF MECHANICAL AND AEROSPACE  
ENGINEERINGCOLORADO STATE UNIV FORT COLLINS ENGINEERING RESEARCH  
CENTER(U) AFAPRT (Air Force Research in Aero Propulsion  
Technology) Trainee Program.(U) The Verification of Numerical Models with Multivariate  
Randomized Block Permutation Procedures.

JUN 89

89

PERSONAL AUTHORS: Glassman, Irvin

PERSONAL AUTHORS: Tucker, D. F.; Mielke, P. W., Jr.;  
Reiter, E. R.

CONTRACT NO. AFOSR-85-0292

CONTRACT NO. F49620-86-C-0080, NSF-ATM86-10796

PROJECT NO. 2308

PROJECT NO. 2310

TASK NO. A2

TASK NO. A1

MONITOR: AFOSR  
TR-89-1182MONITOR: AFOSR  
TR-89-1089

UNCLASSIFIED REPORT

UNCLASSIFIED REPORT

ABSTRACT: (U) Four AFAPRT students were in residence in Princeton University's Department of Mechanical and Aerospace Engineering during the subject period. Two have been awarded M.S.E. degrees and accepted positions in the aircraft propulsion fields. Another will receive the M.S.E. degree in 1989 and has also accepted a position in the jet engine field. The fourth has continued his studies to pursue the Ph.D. degree. These students performed their industrial traineeships with General Electric-Cincinnati, Pratt & Whitney East Hartford and West Palm Beach, and United Technologies Research Center. Keywords: Aero propulsion technology trainees. (SDW)

DESCRIPTORS: (U) \*AERONAUTICAL ENGINEERING, \*AEROSPACE SYSTEMS, \*TRAINEES, AIR FORCE RESEARCH, AIRCRAFT, JET ENGINES, PROPULSION SYSTEMS, RESEARCH FACILITIES, STUDENTS.

IDENTIFIERS: (U) PE61102F, WUAFOSR2308A2

SUPPLEMENTARY NOTE: Pub. in Meteorology and Atmospheric Physics, v40 n4 p181-188.

ABSTRACT: (U) Multivariate randomized block permutation procedures (MRBP) can be used effectively to verify numerical models. Compared to other statistical methods, MRBP shows several distinct advantages. First of all, MRBP operates in the same Euclidean analysis space as its input data. The root mean square error (RMSE) is discussed, since it is a natural choice as a distance measure between two data sets and is closely related to the distance measure on which MRBP is based. The RMSE by itself provides no basis for inferential comparisons, whereas MRBP is well suited for such deductions. Since MRBP is computationally economical and required only a few case studies for meaningful comparisons, it is also useful for model development. Keywords: Reprints (KR)

DESCRIPTORS: (U) \*MATHEMATICAL MODELS, \*VALIDATION, CASE STUDIES, DATA BASES, ERRORS, INPUT, MEAN, MEASUREMENT, MULTIVARIATE ANALYSIS, PERMUTATIONS, RANGE(DISTANCE), REPRINTS, STATISTICAL PROCESSES.

IDENTIFIERS: (U) PE61102F, WUAFOSR2310A1

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FLORIDA UNIV GAINESVILLE

WASHINGTON UNIV SEATTLE

(U) Couple-Cluster Methods That Include Connected  
Quadruple Excitations, T4: CCSDTQ-1 and Q(CCSDT),

(U) Graded Bandgap Solar Cells.

JUN 89

DESCRIPTIVE NOTE: Final rept. 1 Sep 84-30 Sep 88.

JUN 89

PERSONAL AUTHORS: Kucharski, Stanislaw A.; Bartlett,  
Rodney J.

PERSONAL AUTHORS: Olsen, Larry C.

CONTRACT NO. AFOSR-88-0041

CONTRACT NO. AFOSR-84-0355

PROJECT NO. 2301

PROJECT NO. 2301

TASK NO. A4

TASK NO. A7

MONITOR: AFOSR  
TR-89-1100

MONITOR: AFOSR  
TR-89-1186

## UNCLASSIFIED REPORT

## UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Chemical Physics Letters,  
v158 n6 p550-555, 23 Jun 89.

ABSTRACT: (U) This program has emphasized investigations of graded bandgap solar cells. The key objective was to determine the feasibility of obtaining high efficiencies with a graded emitter heterojunction structure. The Al(x)Ga(1-x)As ternary system was selected for actual device fabrication and characterization. Interpretation of photoreponse data for graded devices indicated that the minority carrier diffusion length was essentially zero for x equal to or greater than .25. This property of the AlGaAs films made it impossible to obtain the expected photocurrent from the graded devices. However, studies were carried out which clearly indicated that the structures with graded emitters were characterized by an enhanced photoreponse relative to homojunction devices. (JES)

DESCRIPTORS: (U) \*QUADRUPOLE MOMENT, \*MOLECULAR COMPLEXES, REPRINTS.

DESCRIPTORS: (U) \*SOLAR CELLS, CHARGE CARRIERS, DIFFUSION, EFFICIENCY, EMITTERS, HETEROJUNCTIONS, LENGTH, PHOTSENSITIVITY, TERNARY COMPOUNDS.

IDENTIFIERS: (U) WUAFOSR2301A4, PE61102F.

IDENTIFIERS: (U) PE61102F, WUAFOSR2301A7.

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ALASKA UNIV FAIRBANKS GEOPHYSICAL INST

MARYLAND UNIV COLLEGE PARK DEPT OF MATHEMATICS

(U) Development of Computer Codes to Model Dynamics of the Earth's Magnetosphere.

(U) Rank-Preserving Extensions of Band Matrices.

DESCRIPTIVE NOTE: Final rept. 1 Dec 85-31 May 89.

88

APR 89

PERSONAL AUTHORS: Swift, Daniel W.

PERSONAL AUTHORS: Ellis, Robert L.; Lay, David C.

CONTRACT NO. AFOSR-86-0037

CONTRACT NO. AFOSR-87-0287

PROJECT NO. 2311

PROJECT NO. 2304

TASK NO. A1

TASK NO. A6

MONITOR: AFOSR  
TR-89-1108

MONITOR: AFOSR  
TR-89-1080

UNCLASSIFIED REPORT

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Linear and Multilinear Algebra, 1988.

ABSTRACT: (U) The objective of the research has been to develop models of plasma processes in the earth's magnetosphere and ionosphere to understand processes responsible for auroral and magnetic phenomena. One major accomplishment has been the tentative identification of the process for generation of the electric potentials that accelerate auroral electrons. Another major accomplishment is a numerical model of auroral precipitation. The simulation indicate that anomalous resistivity plays little role in electron acceleration processes. The auroral simulation model indicates that the auroral beam may excite upper hybrid electrostatic waves, which may stochastically accelerate a portion of the electron beam to many tens of keV. (JHD)

DESCRIPTORS: (U) \*AURORAE, \*IONOSPHERIC MODELS, \*MAGNETOSPHERE, ANOMALIES, COMPUTER PROGRAMS, DYNAMICS, ELECTRIC POWER, ELECTRICAL RESISTANCE, ELECTRON ACCELERATORS, ELECTRON BEAMS, ELECTRONS, ELECTROSTATICS, HYBRID SYSTEMS, MAGNETIC PROPERTIES, MATHEMATICAL MODELS, PLASMAS(PHYSICS), PRECIPITATION, SIMULAT. MN.

IDENTIFIERS: (U) WUAFOSR2311A1, PEG1102F.

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ABSTRACT: (U) The existence of rank-preserving extensions of a band matrix is analyzed; necessary and sufficient conditions for a unique rank-preserving extension are given. As a corollary, we give a new characterization of, and formula for, the autocorrelation matrix of a stationary stochastic process in the case when the power spectrum consists of pure line spectra. Other applications are given to the problems of unitary or contractive extensions of a triangular matrix. Keywords: Reprints; Signal processing; Autocorrelation matrix; Toeplitz matrix; Band matrix; Rank preserving extensions; Unitary extensions; Extensions to contractions; Matrix theory. (kr)

DESCRIPTORS: (U) \*AUTOCORRELATION, \*MATRIX THEORY, ADAPTERS, LINE SPECTRA, MATRICES(MATHEMATICS), POWER SPECTRA, PURITY, REPRINTS, SIGNAL PROCESSING, STATIONARY, STOCHASTIC PROCESSES.

IDENTIFIERS: (U) WUAFOSR2304A6, PEG1102F.

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COLORADO STATE UNIV FORT COLLINS ENGINEERING RESEARCH CENTER

IDENTIFIERS: (U) PEG1102F, WUAFOSR2310A1.

(U) Heavy Rainfall in Complex Terrain: Insights from a Numerical Model.

89

PERSONAL AUTHORS: Tucker, D. F.; Reiter, E. R.

CONTRACT NO. F49620-86-C-0080, NSF-ATM86-10796

PROJECT NO. 2310

TASK NO. A1

MONITOR: AFOSR

TR-89-1085

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Meteorology and Atmospheric Physics, v40 n4 p194-210 1989.

ABSTRACT: (U) A numerical model is employed to study heavy rainfall events in complex terrain. The model uses a limited-fine-mesh grid and a nested grid, but does not utilize the same set of equations on both grids. Two similar, heavy rainfall cases are contrasted with each other and with a moderate precipitation case. Sensitivity experiments illustrate the effects of topography, synoptic forcing and diabatic heating on these episodes. Model results indicate that heavy rainfall in complex terrain requires a suitable superposition of mass, momentum and moisture fields in relation to the topography. It is the mass and momentum fields, however, which primarily control the location of heaviest precipitation. Synoptically similar events may be different in their underlying causes. The diabatic heating distribution may in some cases be essential to creating such episodes of heavy rain. Keywords: Numerical modeling; Heavy rainfall; Complex terrain; Reprints. (UHD)

DESCRIPTORS: (U) \*WEATHER FORECASTING, \*MOUNTAINS, \*RAINFALL INTENSITY, DISTRIBUTION, HEAT TRANSFER, HEATING, HIGH RATE, MATHEMATICAL MODELS, MOISTURE, MOMENTUM, RAIN, REPRINTS, SENSITIVITY, TERRAIN, THERMODYNAMIC PROPERTIES, TOPOGRAPHY.

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PITTSBURGH UNIV PA SURFACE SCIENCE CENTER

(U) The Activation of Chemical Bonds at Surfaces,

89

PERSONAL AUTHORS: Yates, J. T., JR

CONTRACT NO. AFOSR-82-0133

PROJECT NO. 2303

TASK NO. A2

MONITOR: AFOSR  
TR-89-1184

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Surface science, v14 p74-109,  
n.d.

ABSTRACT: (U) The activation of chemical bonds in molecules adsorbed on surfaces is of fundamental interest in many types of surface chemistry. For example, all heterogeneous catalytic processes proceed by way of bond activation in adsorbed species. Chemical vapor deposition onto semiconductor surfaces to produce thin film semiconductor materials depends upon bond activation at the surface. Surface corrosion processes generally involve activated molecular surface reactions. Thus, it is important to understand the activation of chemical bonds in surface species so that better understanding and control of surface chemical processes may be achieved. In this lecture, a variety of activated surface processes will be discussed with two primary objectives. The first is to illustrate the activation of chemical bonds in surface species starting from very low activation energy molecular events such as hindered molecular rotation on a chemisorption site and proceeding to higher energy activated processes such as surface diffusion and desorption, and finally to chemical bond scission in polyatomic adsorbates, caused either by thermal or by electronic excitation processes. The second objective of the lecture is to use the examples chosen to illustrate certain methods of research which can give detailed molecular level insight into the details of bond activation in surface chemistry. Keywords: Reprints;

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Surface reactions; Chemisorption; Bond activation; Defect sites; Catalysis; ESDIAD; Molecular rotation. (KT)

DESCRIPTORS: (U) \*CHEMICAL BONDS, \*SEMICONDUCTORS, \*SURFACE CHEMISTRY, \*THIN FILMS, ACTIVATION, ADSORBATES, ADSORPTION, BONDING, CATALYSIS, CHEMICAL REACTIONS, CHEMISORPTION, CORROSION, DESORPTION, DIFFUSION, ELECTRONS, ENERGY, EXCITATION, HETEROGENEITY, MATERIALS, MOLECULAR PROPERTIES, MOLECULAR ROTATION, MOLECULAR STATES, MOLECULES, POLYATOMIC MOLECULES, REACTION KINETICS, REPRINTS, SITES, STARTING, SURFACE REACTIONS, SURFACES, VAPOR DEPOSITION.

IDENTIFIERS: (U) PEG1102F, WUAF(SR2303A2, Chemical vapor deposition.

UNCLASSIFIED

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EV109K

AD-A211 526 7/2 AD-A211 526 CONTINUED

STATE UNIV OF NEW YORK AT BUFFALO DEPT OF CHEMISTRY

SYNTHESIS, VOLTAMMETRY.

(U) 1-Methyl-3-Ethylimidazolium Hydrogen Dichloride:  
Synthesis and Application to the Study of Protons in  
Ambient-Temperature Chloroaluminate Ionic Liquids.  
IDENTIFIERS: (U) PE61102F, WUAFOSR2303B2.

DESCRIPTIVE NOTE: Rept. for 1 Dec 86-30 Jun 89.

88

PERSONAL AUTHORS: Zawodzinski, Thomas A., Jr.;  
Osteryoung, R. A.

CONTRACT NO. AFOSR-87-0088

PROJECT NO. 2303

TASK NO. 62

MONITOR: AFOSR  
TR-89-1076

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Inorganic Chemistry, v27  
p4383-4384 1988.

ABSTRACT: (U) The syntheses of 1-methyl-3-ethylimidazolium hydrogen dichloride (ImHC12) and its deuterium analogue (Im2HC12) and their use as proton/deuterium donors in ambient-temperature chloroaluminate melts are described. The material exists as a liquid at room temperature and has been characterized by <sup>1</sup>H NMR spectroscopy. ImHC12 is itself an ambient-temperature molten salt composed of Im cation and HC12 anion. The <sup>2</sup>H NMR chemical shifts of species derived from Im2HC12 in 1-methyl-3-ethylimidazolium chloride/aluminum chloride melts lead us to suggest that HC1 interacts with second chloride in basic melt solutions, whereas it is more weakly complexed in acidic melt solutions. The quantitative addition of a proton by ImHC12 is demonstrated by use of pulse voltammetry. Chloroaluminates; Proton containing molten salt. (jes)

DESCRIPTORS: (U) \*ALUMINATES, \*MELTS, ACIDS, ADDITION, CHEMICAL SHIFTS, CHLORIDES, CHLORINE COMPOUNDS, DEUTERIUM, DONORS(MEDICINE), LIQUIDS, PROTONS, PULSES, ROOM TEMPERATURE, SALTS, SOLUTIONS(GENERAL), SPECTROSCOPY.

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STATE UNIV OF NEW YORK AT BUFFALO DEPT OF CHEMISTRY

IDAHO UNIV MOSCOW DEPT OF CHEMISTRY

(U) Donor-Acceptor Properties of Ambient-Temperature Chloroaluminate Melts.

(U) Synthesis of Sulfodifluoromethylphosphonic Acid.

89

DESCRIPTIVE NOTE: Interim rept. 1 Dec 86-30 Jun 89.

PERSONAL AUTHORS: Zawodzinski, Thomas A., Jr.; Osteryoung, Robert A.

PERSONAL AUTHORS: Burton, Donald J.; Modak, Anil S.; Guneratne, Ranil; Su, Debao; Cen, Wenbiao

89

CONTRACT NO. AFOSR-87-0088

CONTRACT NO. AFOSR-87-0067

PROJECT NO. 2303

PROJECT NO. 2303

TASK NO. B2

TASK NO. B2

MONITOR: AFOSR

MONITOR: AFOSR  
TR-89-1087MONITOR: AFOSR  
TR-89-1077

UNCLASSIFIED REPORT

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Inorg. Chem. v28 p1710-1714 1989.

SUPPLEMENTARY NOTE: Pub. in Jnl. of the American Chemical Society, v111 n5 p1773-1778 1989.

ABSTRACT: (U) The donor-acceptor properties of room-temperature chloroaluminate ionic liquids composed of mixtures of AlCl<sub>3</sub> with either N-(1 butyl)pyridinium chloride or 1-ether-3-methylimidazolium chloride were studied. Gutmann donor and acceptor numbers were determined by using the Eu(III) reduction potential and the 31p chemical shift of triethylphosphine oxide, respectively. Acidic melts are extremely poor donor and strong acceptor media. Basic melts are similar in basicity to DMF. No conclusions concerning the acceptor properties of the basic melt are drawn from this work since the strongly basic probe molecule, Et3P=O, is leveled by the solvent. Conditions under which these parameters are potentially useful are outlined. Keywords: Chloroaluminates; Donor-acceptor numbers. (KT)

ABSTRACT: (U) The incorporation of fluorine into organic compounds has a significant effect on the acidity of the resultant molecule. When the initial substrate is an acid, such as a carboxylic, sulfonic, or phosphonic acid, the acidity is increased several orders of magnitude, and the perfluorinated acid analogues are some of the strongest organic acids known. Acids, such as trifluoroacetic acid and triflic acid, have also become important products of commerce, and derivatives of the long chain analogues are utilized industrially as surfactants and fabric treatment agents. Although not investigated as extensively as the carboxylic or sulfonic acids, the perfluoroalkane phosphonic acids have recently attracted attention as biological chelating agents and electrolytes. (Sulfodifluoromethyl)phosphonic acid, (HO)2P(O)CF2SO3H, has been synthesized for the first time. This mixed phosphonic-sulfonic acid was prepared from (C2H5O)2P(O)CF2SO3Na, which had been synthesized via oxidation of the corresponding sulfinate salt, (C2H5O)2P(O)CF2SO2Na. (jes)

DESCRIPTORS: (U) \*ALUMINATES, \*MELTS, ACIDS, CHLORINE COMPOUNDS, ELECTRON ACCEPTORS, MEDIA, MOLECULES, NUMBERS, PROBES.

DESCRIPTORS: (U) \*ORGANIC COMPOUNDS, \*PHOSPHONIC ACIDS, ACIDS, BIOLOGICAL AGENTS, CARBOXYLIC ACIDS, CHELATING AGENTS, COMMERCE, ELECTROLYTES, FAPNCS, FLUORINE, ORGANIC ACIDS, OXIDATION, SUBSTRATES, SULFONIC ACIDS, SURFACE ACTIVE SUBSTANCES, SYNTHESIS.

IDENTIFIERS: (U) PE61102F, WUAFOSR2303B2.

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INSTITUTE FOR COMPUTER APPLICATIONS IN SCIENCE AND  
ENGINEERING HAMPTON VA

IDENTIFIERS: (U) PE61102F, WUAFOSR2303B2.

(U) Comparing Barrier Algorithms.

DESCRIPTIVE NOTE: Final rept. 1 Jun 85-31 Aug 87.

SEP 87

PERSONAL AUTHORS: Arenstorf, Norbert S.; Jordan, Harry F.

REPORT NO. ICASE-87-65

CONTRACT NO. AFOSR-85-0189, NASI-18107

PROJECT NO. 2304

TASK NO. A3

MONITOR: AFOSR  
TR-89-1127

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Sponsored in part by Contract NAG-1-640.

ABSTRACT: (U) A barrier is a method for synchronizing a large number of concurrent computer processes. After considering some basic synchronization mechanisms, a collection of barrier algorithms with either linear or logarithmic depth will be presented. A graphical model is described that profiles the execution of the barriers and other parallel programming constructs. This model shows how the interaction between the barrier algorithms and the work that they synchronize can impact their performance. One result is that logarithmic tree structured barriers show good performance when synchronizing fixed length work, while linear self-scheduled barriers show better performance when synchronizing fixed length work with an imbedded critical section. The linear barriers are better able to exploit the process skew associated with critical sections. Timing experiments, performed on an eighteen processor Flex/32 shared memory multiprocessor, that support these conclusions are detailed. (kr)

DESCRIPTORS: (U) \*ALGORITHMS, \*BARRIERS, \*COMPUTER

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PROGRAMMING, MULTIPROCESSORS, DATA ACQUISITION, COMPUTERS,  
DEPTH, GRAPHICS, LENGTH, LOGARITHM FUNCTIONS, MODELS,  
PARALLEL PROCESSING, SYNCHRONIZATION(ELECTRONICS), TIME,  
TREES.

MINNESOTA UNIV ST PAUL

(U) High Temperature Superconducting Compounds.

DESCRIPTIVE NOTE: Technical rept. 1 Sep 87-28 Feb 89.

IDENTIFIERS: (U) PE61102F, WUAFOSR2304A3.

MAR 89

PERSONAL AUTHORS: Goldman, A. M.; McCartney, M. L.

CONTRACT NO. AFOSR-87-0372

PROJECT NO. 2308

TASK NO. C1

MONITOR: AFOSR  
TR-89-1107

UNCLASSIFIED REPORT

ABSTRACT: (U) High TC superconductors have been investigated in both bulk and thin film form. Investigations have been carried out on the magnetic properties of both polycrystalline and single crystal forms of YBa2Cu3O7 focussing on time-dependent effects. Single crystals of this material have been studied using scanning tunneling microscopy. Techniques for fabricating thin films have been developed. These include sputtering using spherical targets and co-evaporation using pure ozone as an oxidant. The latter permits the insitu formation of films without any post-deposition annealing step. Superconducting fluctuations and the Kosterlitz-Thouless transition have been studied in the Ti-Ba-Ca-Cu O films. Keywords: High temperature superconductivity. (JES)

DESCRIPTORS: (U) \*MAGNETIC PROPERTIES, \*SPUTTERING, \*SUPERCONDUCTIVITY, ANNEALING, DEPOSITION, FILMS, HIGH TEMPERATURE, MICROSCOPY, OXIDIZERS, OZONE, PURITY, SCANNING, SINGLE CRYSTALS, SUPERCONDUCTORS, THIN FILMS, TUNNELING, VARIATIONS.

IDENTIFIERS: (U) PE61102F, WUAFOSR2306C1.

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ILLINOIS UNIV AT URBANA DEPT OF CHEMISTRY

(U) The Structural and Dynamical Properties of the Sol-Gel Transition.

SEP 88

PERSONAL AUTHORS: Winter, R.; Hua, D. -W.; Song, X.; Jonas, J.

CONTRACT NO. AFOSR-85-0345, NSF-CHE85-09870

PROJECT NO. 2303

TASK NO. A3

MONITOR: AFOSR  
TR-89-1139

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in ILL Workshop Dynamics of Disordered Materials, p1-6 Sep 88.

ABSTRACT: (U) Different experimental techniques have been employed to investigate the macroscopic and microscopic structural and dynamical properties of the sol-gel transition of tetramethoxysilicate. In conclusion, we note that no drastic changes in structure occur at the gelation threshold and the polymer network still changes considerably after gelation. The formed silica network exhibits a self-similar structure, its underlying growth process may be classified as reaction-limited cluster-cluster growth. In comparison, macroscopic dynamical properties like the bulk viscosity diverge at the gel point. Microscopic dynamical properties of molecules much smaller than the correlation length of the clusters exhibit only small motional changes in course of the sol-gel transition, which proceed the appearance of the macroscopic changes by about 10-20% in relative time  $t/t_{gel}$ . The gross features of the sol-gel transition of the silicon alkoxide TMOS can be described within the framework of percolation theory. However, the detailed chemical structure of the monomer, e.g., its time dependent functionality, and probably also solvent effects seem to play an important role in describing finer details and have to be taken into account for a more quantitative theoretical description of the gelation

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process. Keywords: Small angle neutron scattering, Nuclear magnetic resonance, Raman spectroscopy, Fluorescence, Dynamic light scattering, Polarization Reprints. (AW)

DESCRIPTORS: (U) \*GELATION, \*MOLECULAR STRUCTURE, \*COLLOIDS, \*SOLUTIONS(MIXTURES), \*PHASE TRANSFORMATIONS, \*SILICATES, ANGLES, CORRELATION, DYNAMICS, EXPERIMENTAL DESIGN, FLUORESCENCE, GELS, GROWTH(GENERAL), LENGTH, LIGHT SCATTERING, METHODOLOGY, MICROSCOPY, MOLECULES, NETWORKS, NEUTRON SCATTERING, NUCLEAR MAGNETIC RESONANCE, PERCOLATION, POLARIZATION, POLYMERS, RAMAN SPECTROSCOPY, REPRINTS, SILICON DIOXIDE, SOLVENTS, PHASE STUDIES, MOLECULAR PROPERTIES, THEORY, THRESHOLD EFFECTS.

IDENTIFIERS: (U) PE61102F, WUAFOSR2303A3, \*Sol Gel Transition, \*Tetramethoxysilicate, Molecular Dynamics, Silicon Alkoxide.

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WESTINGHOUSE RESEARCH LABS PITTSBURGH PA

MICHIGAN UNIV ANN ARBOR DEPT OF ELECTRICAL ENGINEERING  
AND COMPUTER SCIENCE

(U) Kapitza Conductance of Crystals Cleaved under He II,

JUL 86

(U) Time-Frequency Factors In Auditory Perception.

DESCRIPTIVE NOTE: Annual rept. 15 Apr 88-14 Apr 89,

PERSONAL AUTHORS: Eckels, P. W.; Parker, J. H., Jr.;

JUN 89

CONTRACT NO. F49620-83-C-0129

PERSONAL AUTHORS: Wakefield, Gregory H.

PROJECT NO. 2301

CONTRACT NO. AFOSR-87-0193

TASK NO. A7

PROJECT NO. 2313

MONITOR: AFOSR  
TR-89-1106

TASK NO. A6

MONITOR: AFOSR  
TR-89-1081

## UNCLASSIFIED REPORT

## UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Cryogenics, v26 p427-430 Jul 86.

ABSTRACT: (U) The Kapitza conductance of LiF and KBr single crystals has been measured immediately after cleaving under superfluid helium. Heating techniques were used to evaluate the conductance and it approached the phonon radiation limit for these materials. Cleaving LiF under He II reduced the Kapitza conductance compared to an aged, cleaved surface by only a few percent. Despite the very good cleaved surface obtained with LiF crystals, the results suggest that sufficient microfracturing of the surface occurs upon cleaving to significantly increase the Kapitza conductance over the acoustic mismatch theory values. These results are in contradiction to results obtained by phonon reflection techniques. Keywords: Kapitza; Crystals; Helium; Physical properties; Heat transfer; Reprints. (JHD)

DESCRIPTORS: (U) \*THERMAL RESISTANCE, \*SINGLE CRYSTALS, \*CRYOGENICS, CONDUCTIVITY, HEAT TRANSFER, HEATING, HELIUM, LIMITATIONS, PHONONS, RADIATION, REFLECTION, REPRINTS, SUPERFLUIDITY, LITHIUM FLUORIDES.

IDENTIFIERS: (U) \*Kapitza resistance, Potassium bromides, PEG1102F, WUAFOSR2301A7.

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ABSTRACT: (U) This research investigates how the human auditory system processes temporal properties of a complex signal across two or more regions of the frequency spectrum. Much of the primary research from the original proposal on envelope phase disparity using AM carriers is complete. Several findings are outlined. A computer model has also been developed and analyzed to consider issues of cross-spectral temporal disparities. The model is based on localization by Colburn, among others. Keywords: Hearing; Auditory signals; Auditory signal processing; Computerized simulation. (KT)

DESCRIPTORS: (U) \*AUDITORY PERCEPTION, \*COMPUTERIZED SIMULATION, \*FREQUENCY, \*TIME, AUDITORY SIGNALS, ENVELOPE(SPACE), HEARING, SIGNAL PROCESSING, SIGNALS, SPECTRA.

IDENTIFIERS: (U) PEG1102F, WUAFOSR2313A6.

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STANFORD UNIV CA STANFORD ELECTRONICS LABS

(U) Surface, Interface, and Bulk Properties of High Tc Superconductors.

RANGE(TIME), LOW ENERGY, MATERIALS, PELLETS, PHOTOELECTRIC EMISSION, POLYCRYSTALLINE, SAMPLING, SUPERSTRUCTURES, SYMMETRY, ULTRAHIGH VACUUM.

IDENTIFIERS: (U) PE61102F, WUAFOSR2306C1.

DESCRIPTIVE NOTE: Final rept. 30 Sep 87-29 Apr 89,

JUN 89

PERSONAL AUTHORS: Spicer, William E.; Shen, Z. X.; Lindberg, Per; Dessau, Daniel; Wells, Barrett

CONTRACT NO. AFOSR-87-0389

PROJECT NO. 2306

TASK NO. C1

MONITOR: AFOSR TR-89-1104

UNCLASSIFIED REPORT

ABSTRACT: (U) We have performed extensive studies of the Bi2Sr2CaCu2O8 material ever since its discovery in early 1988. Single crystals, polycrystalline pellets and thin film samples of the Bi2Sr2CaCu2O8 material were examined using various photoemission related techniques. Especially the single crystalline Bi2Sr2CaCu2O8 material was found to have an extraordinary inertness in ultrahigh vacuum conditions, allowing a detailed examination of the surface electronic structure. Consequently, most of our investigations were focused on the single crystalline materials. Low-Energy Electron Diffraction (LEED) was used to confirm the single crystallinity of the in situ cleaved crystals of Bi2Sr2CaCu2O8. Sharp diffraction spots indicative of long range periodicity were observed. The observed LEED pattern showed that the Bi2Sr2CaCu2O8 material preferentially cleaves parallel to the a-b plane. In addition, a superstructure was seen extending along one of the symmetry axes in the a-b plane. The superstructure was found to have a periodicity about 5 times as long as the cell dimensions of the a and b axes, in agreement with the bulk structure. (RH)

DESCRIPTORS: (U) \*CELLS, \*SINGLE CRYSTALS, \*SUPERCONDUCTORS, \*SURFACES, \*THIN FILMS, AXES, ELECTRON DIFFRACTION, ELECTRONICS, LONG RANGE(DISTANCE), LONG

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PENNSYLVANIA STATE UNIV UNIVERSITY PARK

(U) Premixed Turbulent Flame Propagation.

DESCRIPTIVE NOTE: Annual rept. 1 Nov 87-31 Oct 88.

APR 89

convectively distort the flame surface and burning which acts to smooth the flame surface. The model has been compared with the limited turbulent flame kernel growth measurements which are available and very good agreement has been obtained between the measurements and the predictions of the fractal turbulent flame kernel model. (KT)

PERSONAL AUTHORS: Santavicca, D. A.

CONTRACT NO. AFOSR-87-0097

PROJECT NO. 2308

TASK NO. A2

MONITOR: AFOSR  
TR-89-1183

DESCRIPTORS: (U) \*COMBUSTION, \*FLAMES, BAROMETRIC PRESSURE, ENERGY, FLAME PROPAGATION, FREE STREAM, HEAT, HEURISTIC METHODS, INTENSITY, LAMINAR FLOW, LENGTH, MEAN, MIXING, MODELS, MOMENTUM TRANSFER, PARAMETERS, RATIOS, RELEASE, SCALE, SHEAR PROPERTIES, SPECTRA, STABILIZATION, STRESSES, SURFACES, TIME, TURBULENCE, VELOCITY.

IDENTIFIERS: (U) PE61102F, WUAFOSR2308A2.

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: See also rept. dated 8 Jan 88, AD-A192 955.

ABSTRACT: (U) An experimental study has been conducted of turbulence-flame interactions in premixed turbulent flames and their effect on flame-generated turbulence, flame structure and flame propagation. The flame configuration used for this study is that of a freely propagating, one-dimensional (in the mean) turbulent flame which is free of the flame stabilization, free stream shear, and post-flame flow restriction effects of other flame configurations. Flame-generated turbulence has been studied in an atmospheric pressure, propane-air flame at one turbulence condition, where LDV measurements of the mean velocity, turbulence intensity, time scale, energy spectrum, length scale and Reynolds stress have been made as a function of time through the propagating flame front. A three-fold increase in the density weighted turbulent kinetic energy across the flame front is observed. Based on a comparison with similar results from other experiments, this result suggests that the heat release parameter has a greater effect on flame-generated turbulence than the turbulence intensity to laminar flame speed ratio. A heuristic model has been developed which accurately predicts the observed variation in flame structure fractal dimension based on the competition between turbulence which acts to

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INSTITUTE FOR COMPUTER APPLICATIONS IN SCIENCE AND  
ENGINEERING HAMPTON VA

(U) Parallel Computation with the Force.

DESCRIPTIVE NOTE: Final rept. 1 Jun 85-31 Sep 87.

OCT 85

PERSONAL AUTHORS: Jordan, Harry

REPORT NO. ICASE-85-45

CONTRACT NO. AFOSR-85-0189, NASI-17070

PROJECT NO. 2304

TASK NO. A3

MONITOR: AFOSR, NASA  
TR-89-1126, CR-177999

UNCLASSIFIED REPORT

ABSTRACT: (U) A methodology, called the force, supports the construction of programs to be executed in parallel by a force of processes. The number of processes in the force is unspecified, but potentially very large. The force idea is embodied in a set of macros which produce multiprocessors of fairly different character. The method has simplified the writing of highly parallel programs within a limited class of parallel algorithms and is being extended to cover a broader class. This paper deals with the individual parallel constructs which comprise the force methodology. Of central concern are their semantics, implementation on different architectures and performance implications. (KR)

DESCRIPTORS: (U) \*COMPUTER PROGRAMMING, \*PARALLEL PROCESSING, ALGORITHMS, COMPUTATIONS, CONSTRUCTION, METHODOLOGY, MULTIPROCESSORS, SEMANTICS.

IDENTIFIERS: (U) WUAFOSR2304A3, PEG1102F, The Force.

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INSTITUTE FOR COMPUTER APPLICATIONS IN SCIENCE AND  
ENGINEERING HAMPTON VA

(U) Analysis of a Parallelized Nonlinear Elliptic Boundary Value Problem Solver with Application to Reacting Flows.

DESCRIPTIVE NOTE: Final rept. 1 Jun 85-31 Aug 87.

APR 87

PERSONAL AUTHORS: Keyes, David E.; Smooke, Mitchell D.

REPORT NO. ICASE-87-21

CONTRACT NO. AFOSR-85-0189, NASI-18107

PROJECT NO. 2304

TASK NO. A3

MONITOR: AFOSR, NASA  
TR-89-1110, CR-178274

UNCLASSIFIED REPORT

ABSTRACT: (U) A parallelized finite difference code based on Newton's method for systems of non-linear elliptic boundary value problems in two dimensions is analyzed in terms of computational complexity and parallel efficiency. An approximate cost function depending on 15 dimensionless parameters (including discrete problem dimensions, convergence parameters, and machine characteristics) is derived for algorithms based on stripe and boxwise decompositions of the domain and a 1:1 assignment of the stripe or box subdomains to processors. Sensitivity of the cost function to the parameters is explored in regions of parameter space corresponding to model small-order systems with inexpensive function evaluations and also a coupled system of 19 equations with very expensive function evaluations (a reacting flow model of engineering interest which motivates the work. The algorithm was implemented on the Intel Hypercube, and some experimental results for the model problems with stripe decompositions are presented and compared with the theory. In the context of computational combustion problems, multiprocessors of either message-passing or shared-

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memory type may be employed with stripwise decompositions to realize speedups of  $O(n)$ , where  $n$  is mesh resolution in one direction, for reasonable  $n$ . To realize speedups of  $O(n^2)$ , the total number of mesh points, only hypercubes appear attractive. These results must be qualified by hardware assumptions, including sufficient local memory per processor to hold all of the data defined on the associated subdomain, and selection of machine parameters typical of presently commercially available components. CFD. (edc)

DESCRIPTORS: (U) \*BOUNDARY VALUE PROBLEMS, \*FLOW, \*PARALLEL PROCESSING, ALGORITHMS, CODING, COMBUSTION, COMPUTATIONS, CONVERGENCE, COSTS, COUPLING(INTERACTION), DECOMPOSITION, EFFICIENCY, ENGINEERING, FINITE DIFFERENCE THEORY, FUNCTIONS(MATHEMATICS), MEMORY DEVICES, MESH, MATHEMATICAL MODELS, MULTIPROCESSORS, NONLINEAR ANALYSIS, PARAMETERS, PROBLEM SOLVING, RESOLUTION, TWO DIMENSIONAL.

IDENTIFIERS: (U) \*Reacting flow, Decomposition(Mathematics), Stripwise decomposition, WUAFDSR2304A3, PEB1102F.

MASSACHUSETTS INST OF TECH CAMBRIDGE COMPUTATIONAL FLUID DYNAMICS LAB

(U) Computational Methods for Complex Flowfields.

DESCRIPTIVE NOTE: Final rept. 1 Jun 87-31 May 89.

JUL 89

PERSONAL AUTHORS: Murman, Earl M.; B2- , Judson R.

CONTRACT NO. AFOSR-87-0218

PROJECT NO. 2307

TASK NO. A1

MONITOR: AFOSR  
TR-89-1072

UNCLASSIFIED REPORT

ABSTRACT: (U) Development of solution algorithms for complex flowfields has been the objective of this research. Embedded subdomains were used to resolve relevant physical processes in a global flow around aerodynamic bodies. Adaptive approaches were studied and developed for the two- and three-dimensional Euler equations and two-dimensional Navier Stokes equations using finite volume and finite element methods. A new approach is reported for combining expert system approaches with adaptive procedural algorithms into a totally integrated methodology. Recent results on formulation of outflow boundary conditions for the Navier Stokes equations and compact high-order schemes for the Euler equations are also presented. Additional tasks included: studying the performance of CFD algorithms on several parallel processors; a short study on turbulent spot measurements; and the prediction of dispersive errors in numerical solution of the Euler equations. Keywords: Numerical methods and procedures; Euler equations; Navier-Stokes equations; Finite element methods; Embedded grids; Adaptive grids; Computational fluid dynamics. (edc)

DESCRIPTORS: (U) \*FLOW FIELDS, \*FLUID DYNAMICS, \*NUMERICAL METHODS AND PROCEDURES, ADAPTIVE SYSTEMS, AERODYNAMICS, ALGORITHMS, BOUNDARIES, COMPUTATIONS.

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COMPUTER PROGRAMS, DIFFERENTIAL EQUATIONS, DISPERSING, EMBEDDING, ERRORS, FINITE ELEMENT ANALYSIS, GRIDS, INTEGRATED SYSTEMS, MEASUREMENT, NAVIER STOKES EQUATIONS, NUMERICAL ANALYSIS, PARALLEL PROCESSORS, MATHEMATICAL PREDICTION, SOLUTIONS(GENERAL), THREE DIMENSIONAL, TURBULENCE, TWO DIMENSIONAL, VOLUME.

PENNSYLVANIA STATE UNIV UNIVERSITY PARK DEPT OF ELECTRICAL ENGINEERING

(U) Sensitivity Evaluation Plan for Lowtran.

DESCRIPTIVE NOTE: Final rept..

IDENTIFIERS: (U) Euler equations, Expert systems, Computational fluid dynamics, Complex flow fields, WUAFOSR2307A1, PE61102F.

AUG 88

PERSONAL AUTHORS: Tomiyama, Ken; Hogan, Michael

CONTRACT NO. F49620-87-C-0057

PROJECT NO. 2310

TASK NO. A1

MONITOR: AFOSR  
TR-89-1056

UNCLASSIFIED REPORT

ABSTRACT: (U) The computer code LOWTRAN, developed by the Air Force Geophysics Laboratory, computes transmittance and radiance for given climatological conditions and path geometries over given spectral regions within 350 to 20,000 per cm. Naturally, usefulness of its output is determined by the accuracy of the input variables. Input climatological conditions should be specified as accurate as possible for successful utilization of LOWTRAN results. However, atmospheric variables are inherently difficult to specify with high accuracy due to their significant variability. Therefore, it is critical to evaluate the effects of input uncertainties on the output accuracy, in other words, the sensitivity of LOWTRAN outputs to input variations. This requires a compilation of numerous LOWTRAN computations and an appropriate method of presenting the sensitivity. (RH)

DESCRIPTORS: (U) \*CLIMATOLOGY, \*COMPUTER PROGRAMS, \*PATHS, \*RADIANCE, \*TRANSMITTANCE, ACCURACY, COMPUTATIONS, GEOMETRY, HIGH RATE, INPUT, OUTPUT, PLANNING, REGIONS, SENSITIVITY, SPECTRA, TEST AND EVALUATION, VARIABLES.

IDENTIFIERS: (U) WUAFOSR2310A1, PE61102F.

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NEW YORK UNIV N Y DEPT OF PSYCHOLOGY

(U) The Kinetic Depth Effect and Identification of Shape,

87

PERSONAL AUTHORS: Sperling, George; Landy, Michael S.;  
Doshier, Barbara A.; Perkins, Mark E.

CONTRACT NO. AFOSR-88-0140

PROJECT NO. 2313

TASK NO. A5

MONITOR: AFOSR  
TR-89-1058

UNCLASSIFIED REPORT

ABSTRACT: (U) This paper introduces an objective shape-identification task for measuring the kinetic depth effect. The observer views an array of many randomly positioned dots that move from frame to frame. The dot motions define a 3D shape consisting of bumps and depressions on an otherwise flat ground. On each trial, a presented shape is chosen from a large lexicon of shapes that vary in size, position, and number of bumps. The observer's task is to identify the shape and its overall direction of rotation. Identification accuracy in the 3D shape identification task is an objective measure, with a low guessing base rate, of the observer's perceptual ability to reconstruct a global 2D motion flow field. Objective accuracy data are shown to be generally consistent with previously obtained subjective rating judgments of depth and coherence. Along with motion cues, rotation of real 3D dot-defined shapes inevitably produces a cue of changing dot density. By using a dot-lifetime manipulation, to control dot density in our computer generated shapes, we show that changing density is neither necessary nor sufficient to account for the observer's performance; i.e., motion is sufficient for the KDE. Extractions of motion cues from 6 optimally relevant locations would support perfect KDE performance with our stimuli. A simplified 2D motion identification task with 6 perceptually flat flow-fields was derived from the 3D KDE task. Subjects' performance in the 2D and 3D tasks is equivalent, indicating that the information

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processing capacity in KDE is comparable to information processing in other domains. Visual perception. (edc)

DESCRIPTORS: (U) \*INFORMATION PROCESSING, \*PERCEPTION(PSYCHOLOGY), \*VISUAL PERCEPTION, ACCURACY, COHERENCE, COMPUTER GRAPHICS, CUES(STIMULI), DENSITY, DEPTH, DIRECTIONAL, FRAMES, GEOMETRIC FORMS, IDENTIFICATION, KINETICS, MOTION, OBSERVERS, OBSERVATION, PERFORMANCE(HUMAN), POSITION(LOCATION), PSYCHOLOGICAL TESTS, OBSERVATION, RATES, ROTATION, SHAPE, SIZES(DIMENSIONS), THREE DIMENSIONAL, VARIABLES, VISUAL TARGETS.

IDENTIFIERS: (U) Kinetic depth effect, Depth perception, Motion perception, WUAFOSR2313A5, PE61102F.

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MASSACHUSETTS UNIV AMHERST DEPT OF POLYMER SCIENCE AND  
ENGINEERING

MIXTURES, NONLINEAR SYSTEMS, OPTICAL PROPERTIES, PHASE  
STUDIES, PHYSICAL PROPERTIES, POROUS MATERIALS, SEQUENCES,  
STATE OF THE ART, TWO DIMENSIONAL, X RAYS.

(U) Ultrastructure Processing and Characterization of  
Polymers.

IDENTIFIERS: (U) PE61102F, WUAFOSR2303A3, Conjugated  
polymers, Phenylene vinylene.

DESCRIPTIVE NOTE: Final rept. 7 Oct 87-30 Sep 88.

88

PERSONAL AUTHORS: Karasz, Frank E.

PROJECT NO. 2303

TASK NO. A3

MONITOR: AFOSR  
TR-89-1185

UNCLASSIFIED REPORT

ABSTRACT: (U) During this period the research program contained components dealing inter alia with polymer blends, electro- and optically-active polymers, computer simulation of blend phenomena, dynamic light scattering measuring diffusion in porous media, and aspects of ultrastructural processing. New state-of-the-art instrumentation was developed, including a two-dimensional x-ray system and solid state NMR. In the area of polymer blends we have continued to emphasize the effect of chain microstructure on miscibility in multi-component systems. This has involved phase behavior studies of copolymer-containing blends, where the structure of the copolymer have been varied in terms of chemistry, tacticity and/or sequence distribution. In the electro-active polymer area, we have concentrated on research involving poly(p-phenylene vinylene) (PPV) and its derivatives, copolymers, and blends. The electrical and, more recently, the non-linear optical properties of this family of conjugated polymers has proved to be of particular interest and potential applicability. Keywords: Polymer chemistry; Physical properties; Molecular physics. (KT)

DESCRIPTORS: (U) \*OPTICAL PROPERTIES, \*ELECTRICAL PROPERTIES, \*MOLECULAR STRUCTURE, \*POLYMERS, BEHAVIOR, CHAINS, CHEMISTRY, COMPUTERIZED SIMULATION, COPOLYMERS, DISTRIBUTION, INSTRUMENTATION, MICROSTRUCTURE, MIXING,

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SOUTHERN METHODIST UNIV DALLAS TX DEPT OF MATHEMATICS

CALIFORNIA INST OF TECH PASADENA GRADUATE AERONAUTICAL LABS

(U) The Slowly Varying Phase Shift for Perturbed, Single and Multi-Phased, Strongly Nonlinear, Dispersive Waves,

(U) Control of Turbulent Mixing Layers.

89

DESCRIPTIVE NOTE: Final rept. 1 Jun 84-31 Dec 88.

PERSONAL AUTHORS: Bourland, F. J.; Haberman, Richard

APR 89

CONTRACT NO. AFOSR-87-0134

PERSONAL AUTHORS: Dimotakis, Paul E.; Koochesfahani, Manoocher M.

MONITOR: AFOSR TR-89-1065

CONTRACT NO. AFOSR-84-0120

UNCLASSIFIED REPORT

PROJECT NO. 2308

SUPPLEMENTARY NOTE: Pub. in Physica D, v35 p127-147 1989.

TASK NO. A2

ABSTRACT: (U) Slowly varying, strongly nonlinear, dispersive, oscillatory waves are analyzed for equations which may be represented by a Lagrangian, including the effects of perturbations. The linear partial differential equation for the modulations of the phase shift follows from a perturbation analysis of the exact equation for wave action. For purely dissipative perturbations, it is shown that variations of the wave action, its flux, and its dissipation are due to perturbations of the wave number and frequency (if, in addition, the dissipative effect of a higher-order perturbation is included), a result the authors have previously developed for some specific problems. Similar conclusions are also derived for strongly nonlinear dispersive waves with higher spatial dimension and with multiple oscillatory phases. Furthermore, only the nonhomogeneous terms for the phase shift are altered for more general perturbations. Reprints. (JHD)

DESCRIPTORS: (U) \*DISPERSING, \*LAGRANGIAN FUNCTIONS, DISSIPATION, LINEAR DIFFERENTIAL EQUATIONS, NONLINEAR SYSTEMS, OSCILLATION, PARTIAL DIFFERENTIAL EQUATIONS, PERTURBATIONS, PHASE, PHASE SHIFT, REPRINTS, SIZES(DIMENSIONS), SPATIAL DISTRIBUTION, WATER WAVES, WAVES.

IDENTIFIERS: (U) WUAFOSR2304A9, PE61102F.

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ABSTRACT: (U) Study of the open-loop forcing of the shear layer by a pitching airfoil led to the following results: it is possible to induce very large changes in the shear layer growth rate downstream of the disturbance location, while leaving the portion of the layer between the splitter plate and the disturbance location essentially unaffected; upstream forcing can be used to modify the shear layer in the region upstream of the disturbance; two different mechanisms are responsible for coupling such disturbances to the flow in the cases of upstream and downstream forcing. An investigation into the structure of the wake of a pitching airfoil in a uniform stream revealed that the proper choice of the pitch oscillation parameters can result in significant alterations of the wake. In particular, flow regimes corresponding to wake, jet, double-wake and mixed jet-wake structures can be generated. Further study of the axial flow along the wake vortices indicated that the magnitude of the flow increases approximately linearly with both the amplitude and frequency of oscillation. The closed-loop feedback phase of the project was initiated by the demonstration of a cancellation experiment in a forced turbulent shear layer. Keywords: Turbulent flow control; feedback control systems; Turbulent shear layer flow; Unsteady separated flow; Two dimensional flow;

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Vortices; Oscillating airfoils wake. (EDC)

WESTINGHOUSE ELECTRIC CORP PITTSBURGH PA ADVANCED ENERGY SYSTEMS DIV

DESCRIPTORS: (U) \*AIRFOILS, \*PITCH(MOTION), \*TURBULENT FLOW, \*WAKE, AXIAL FLOW, CANCELLATION, CLOSED LOOP SYSTEMS, CONTROL, CONTROL SYSTEMS, FEEDBACK, FLOW, FLOW SEPARATION, FREQUENCY, LAYERS, MIXING, OPEN LOOP SYSTEMS, OSCILLATION, PARAMETERS, POSITION(LOCATION), SHEAR PROPERTIES, STREAMS, TURBULENCE, TWO DIMENSIONAL FLOW, UNSTEADY FLOW, VORTICES.

(U) An Investigation of the Irradiation Swelling Mechanisms in Refractory Metals at High Temperatures.

DESCRIPTIVE NOTE: Final scientific rept. 1 Mar 85-31 Jul 88.

JUN 89

IDENTIFIERS: (U) Turbulent mixing layer, Pitching airfoils, PE61102F, WUAF0SR2308A2.

PERSONAL AUTHORS: Baja, R.; Hall, B. O.; Fenske, G. R.; Gregg, J. C.; Taylor, A. T.

REPORT NO. WAES-TR-89-0010

CONTRACT NO. F49620-85-C-0060

PROJECT NO. 2301

TASK NO. A7

MONITOR: AFOSR  
TR-89-1051

UNCLASSIFIED REPORT

ABSTRACT: (U) This report presents the results of an investigation of elevated temperature irradiation swelling in refractory metals with an objective of understanding swelling mechanisms in these materials and demonstrating practicality of swelling-resistant materials. The study was divided into three phases. During the first phase, a theoretical model was developed for the swelling in body-centered cubic (bcc) metals. The model was based on chemical reaction rate formalism. Calculations were carried out on a model material, niobium, which was selected for the study. Experimental and theoretical work was conducted to determine the swelling mechanism. Niobium was irradiated with Nb(+) ions to a dose of 50 dpa and swelling was determined by transmission electron microscopy. A peak swelling at 900C of 7% was observed. No swelling was observed above 1300C. The experimental data were compared to those predicted by the theoretical model. Reasonable agreements were obtained between the experimental and theoretical swelling curve when niobium-oxygen interaction was included. Sink strength ratios were also calculated from

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the data. The theoretical model was extended during the second phase to include loop growth/shrinkage in bcc metals. During the third phase of the program, two alloys, Nb-5Hf and Nb-5W, were irradiated with Nb(++) alone and with Nb(++) + He(+) over a temperature range of 800 - 1350C. (AW)

DESCRIPTORS: (U) \*NIOBIUM, \*THERMAL EXPANSION, \*IRRADIATION, ALLOYS, CHEMICAL REACTIONS, ELECTRON MICROSCOPY, EXPERIMENTAL DATA, GROWTH(GENERAL), HIGH TEMPERATURE, LOOPS, MATERIALS, METALS, MODELS, PHASE, RATES, REACTION TIME, REFRACTORY METALS, SECONDARY, SHRINKAGE, THEORY, TRANSMITTANCE, NIOBIUM ALLOYS, CATIONS, REACTION KINETICS, HELIUM, OXYGEN.

IDENTIFIERS: (U) PE61102F, WUAFOSR2301A7, \*Swelling, Body Centered Cubic Lattices, Sink Strength Ratios.

ILLINOIS UNIV AT URBANA DEPT OF CHEMISTRY

(U) The Effect of Fluoride on the Sol-Gel Process.

JUN 89

PERSONAL AUTHORS: Winter, R.; Chan, J. B.; Frattini, R.; Jonas, J.

CONTRACT NO. AFOSR-85-0345

PROJECT NO. 2303

TASK NO. A3

MONITOR: AFOSR  
TR-89-1140

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Jnl. of Non-Crystalline Solids, v105 p214-222 1988.

ABSTRACT: (U) Natural abundance Silicon 29 Nuclear Magnetic Resonance employed to investigate the effects of fluoride ion on the gelation process in tetramethylorthosilicate at pH = 6.4. In addition, the BET method was used to carry out the pore analysis of the dried gels. Both the NMR and Raman data show that the presence of fluoride anions not only accelerates the gelation process but lead to a different polymerization process. The condensation proceeds via the formation of higher branched polymers, and the dimers and trimers do not play a significant role in the polymerization process. A high percentage of organic- $\text{OCH}_3$  groups is present in the silicon network at the gelation point. The pore analysis of dried gels shows that the fluoride ion leads to the formation of a loose and relatively open silica network with a large fraction of mesopores. (AW)

DESCRIPTORS: (U) \*ANIONS, \*CONDENSATION REACTIONS, \*FLUORIDES, \*GELATION, \*SILICATES, DRY MATERIALS, GELS, IONS, NETWORKS, POLYMERIZATION, POLYMERS, RAMAN SPECTRA, SILICON, SILICON DIOXIDE, NUCLEAR MAGNETIC RESONANCE.

IDENTIFIERS: (U) PE61102F, WUAFOSR2303A3, \*Sol Gel processes, Mesopores, \*Tetramethylorthosilicate, Silicate/Tetramethylortho, Methoxy groups.

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INSTITUTE FOR COMPUTER APPLICATIONS IN SCIENCE AND  
ENGINEERING HAMPTON VA

(U) The Force on the Flex: Global Parallelism and  
Portability.

DESCRIPTIVE NOTE: Final rept. 1 Jun 83-31 Aug 87,

AUG 87

PERSONAL AUTHORS: Jordan, Harry F.

REPORT NO. ICASE-86-54

CONTRACT NO. NAS1-17070, \$AFOSR-85-0189

PROJECT NO. 2304

TASK NO. A3

MONITOR: AFOSR, NASA  
TR-89-1128, CR-178161

UNCLASSIFIED REPORT

ABSTRACT: (U) A parallel programming methodology, called the force, supports the construction of programs to be executed in parallel by an unspecified, but potentially large, number of processes. The methodology was originally developed on a pipelined, shared memory multiprocessor, the Denelcor HEP, and embodies the primitive operations of the force in a set of macros which expand into multiprocessor Fortran code. A small set of primitives is sufficient to write large parallel programs, and the system has been used to produce 10,000 line programs in computational fluid dynamics. The level of complexity of the force primitives is intermediate. It is high enough to mask detailed architectural differences between multiprocessors but low enough to give the user control over performance. The system is being ported to a medium scale multiprocessor, the Flex/32, which is a 20 processor system with a mixture of shared and local memory. Memory organization and the type of processor synchronization supported by the hardware on the two machines lead to some differences in efficient implementations of the force primitives, but the user interface remains the same. An initial implementation was done by retargeting the macros to Flexible Computer

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INSTITUTE FOR COMPUTER APPLICATIONS IN SCIENCE AND  
ENGINEERING HAMPTON VA

SOLVING.

IDENTIFIERS: (U) PE61102F, WUAFOSR2304A3.

(U) Polynomial Approximation of Functions of Matrices and  
Its Application the the Solution of a General System  
of Linear Equations.

DESCRIPTIVE NOTE: Final rept. 1 Jun 85-31 Aug 87.

AUG 87

PERSONAL AUTHORS: Tal-Ezer, Hillel

REPORT NO. ICASE-87-63

CONTRACT NO. NAS1-18107, \$AFOSR-85-0189

PROJECT NO. 2304

TASK NO. A3

MONITOR: AFOSR, NASA  
TR-89-1109, CR-178378

UNCLASSIFIED REPORT

ABSTRACT: (U) Frequently, during the process of solving a mathematical model numerically, we end up with a need to operate on a vector  $v$  by an operator which can be expressed as  $f(A)$  while  $A$  is  $N \times N$  matrix. Except for very simple matrices, it is impractical to construct the matrix  $f(A)$  explicitly. Usually an approximation to it is used. In the present research, we develop an algorithm which uses a polynomial approximation to  $f(A)$ . It is reduced to a problem of approximating  $f(z)$  by a polynomial in  $z$  while  $z$  belongs to the domain  $D$  in the complex plane which includes all the eigenvalues of  $A$ . This problem of approximation is approached by interpolating the function  $f(z)$  in a certain set of points which is known to have some maximal properties. The approximation thus achieved is almost best. Implementing the algorithm to some practical problem is described.

DESCRIPTORS: (U) \*APPROXIMATION(MATHEMATICS), \*LINEAR ALGEBRA, \*MATRICES(MATHEMATICS), \*ALGORITHMS, EIGENVALUES, LINEAR ALGEBRAIC EQUATIONS, MATHEMATICAL MODELS, POLYNOMIALS, NUMERICAL METHODS AND PROCEDURES, PROBLEM

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UNITED TECHNOLOGIES RESEARCH CENTER EAST HARTFORD CT

ILLINOIS UNIV AT URBANA DEPT OF CHEMISTRY

(U) Laser-Induced Saturated Fluorescence of SrOH in Flames.

(U) The Pore Morphology of Fluoride Catalyzed Xerogels.

APR 89

DESCRIPTIVE NOTE: Rept. for 1 Nov 88-31 May 89.

PERSONAL AUTHORS: Bonczyk, Paul A.

JUN 89

CONTRACT NO. F49620-83-C-0113

PERSONAL AUTHORS: Chan, J. B.; Hua, D. W.; Winter, R.; Jonas, J.

PROJECT NO. 2308

CONTRACT NO. AFOSR-85-0345

TASK NO. A2

PROJECT NO. 2303

MONITOR: AFOSR  
TR-89-1105

TASK NO. A3

UNCLASSIFIED REPORT

MONITOR: AFOSR  
TR-89-1138

SUPPLEMENTARY NOTE: Pub. in Applied Optics, v28 n8 p1529-1532, 15 Apr 89.

UNCLASSIFIED REPORT

ABSTRACT: (U) Laser-induced fluorescence measurements of Strontium Hydroxide have been made in a fuel-rich sooting atmospheric pressure Ethylene air diffusion flame seeded with a strontium salt. The dependence of fluorescence intensity on laser spectral intensity was observed to reach near full saturation at a laser spectral intensity of 10 to the 10th power w/sq. cm/cm. To our knowledge, this is the first observation of the saturated fluorescence of a polyatomic species in a flame. The precise conditions which saturation can be observed, and the factors which hinder its observation, are discussed in detail. Comparisons are made with OH fluorescence measurements in the same flame. Reprints. (AW)

DESCRIPTORS: (U) \*FLAMES, \*HYDROXIDES, \*LASER INDUCED FLUORESCENCE, \*STRONTIUM, INTENSITY, LASERS, MEASUREMENT, OBSERVATION, POLYATOMIC MOLECULES, PRECISION, REPRINTS, SALTS, SATURATION, SPECTRAL ENERGY DISTRIBUTION, FUEL AIR RATIO, FUEL BURN UP, SOOT, ETHYLENE, SEEDING.

IDENTIFIERS: (U) PE61102F, WUAFOSR2308A2, \*Strontium Hydroxides, Ethylene Air Diffusion Flames, Diffusion Flames.

SUPPLEMENTARY NOTE: Pub. in Jnl. of Materials Research, v4 n3 p693-697 May/June 89.

ABSTRACT: (U) The fluoride anion has been shown to be one of the most effective catalysts in accelerating the polycondensation of alkoxide-derived silica gels. A detailed pore analysis study has been employed to investigate the effect of Sodium Fluoride on the pore structure of the resulting xerogels and its evolution during thermal heat treatment up to 800 C. addition of NaF to tetramethylorthosilicate-sols leads to an increase in average pore size, and the pore size distribution become narrower. By changing the fluoride concentration and the heating temperature, the surface properties of the xerogels can be tuned over a wide range. The possible application of the F anion catalyzed sol gel process to prepare porous host materials for the studies of fluids in restricted geometries is also discussed. Reprints. (AW)

DESCRIPTORS: (U) \*FLUORIDES, \*SODIUM, \*SILICA GELS, \*CATALYSIS, \*CONDENSATION REACTIONS, \*POLYMERS, ANIONS, CATALYSTS, FLUIDS, GELS, HEAT TREATMENT, HEATING, LIMITATIONS, POROUS MATERIALS, REPRINTS, SURFACE PROPERTIES, TEMPERATURE, MORPHOLOGY, SOLUTIONS(MIXTURES), COLLOIDS, SILICATES.

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IDENTIFIERS: (U) PE61102F, WUAFOSR2303A3, \*Xerogels,  
Polycondensation, Alkoxides, Pore Size,  
Tetramethylorthosilicates, Sols, Sol Gel Interactions.

COLUMBIA UNIV NEW YORK

(U) Photochemistry of Dibenzyl Ketone Adsorbed on Size/  
Shape Selective Faujasite Zeolites. Steric Effects on  
Product Distributions.

DESCRIPTIVE NOTE: Rept. for 1987-1988,

89

PERSONAL AUTHORS: Turro, Nicholas J.; Zhang, Zhenyu

CONTRACT NO. AFOSR-88-0043

PROJECT NO. 2303

TASK NO. 82

MONITOR: AFOSR  
TR-89-1132

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Studies in Surface Science &  
Catalysis, v47 p197-215 1989.

ABSTRACT: (U) Zeolites are robust, crystalline, porous aluminosilicates possessing an enormous internal surface area that is capable of adsorbing large quantities of guest molecules, the size and shape of whose structures allow them to pass from the external to the internal zeolitic surface and to diffuse on the internal surface. The framework composition, the presence of cations associated with the framework, and the topology of the void space internal to the zeolite all contribute to imbue these materials with special properties that contribute to their widespread use as catalysts, ion exchange materials and molecular sieves. Photochemical probes have been developed to explore the structure of zeolites near the sites of adsorption and to examine the dynamics of reactions of molecules adsorbed on the internal zeolite surface. In this chapter, we review the structure of zeolites in general, and then survey the structure of an important class of zeolites, the faujasites. We then show how a photochemical probe, the photochemistry of dibenzyl ketone, can yield information on how intracrystalline dynamics can be influenced by cation type, cation number density and coadsorbed guests and, in turn, how

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intracrystalline dynamics can determine the products of photoreactions. Keywords: Reprints; Zeolites; Dibenzyl ketone; Catalysts; Faujasites; Molecular sieves; Diffusion; Photochemical probes; Supercages; Primary radical pairs; Cations. (KT)

DESCRIPTORS: (U) \*ALUMINUM COMPOUNDS. \*BENZYL RADICALS. \*PHOTOCHEMICAL REACTIONS. ADSORPTION. CATALYSTS. CATIONS. DENSITY. DISTRIBUTION. DYNAMICS. INTERNAL. ION EXCHANGE. KETONES. MATERIALS. MOLECULAR SIEVES. MOLECULES. POROUS MATERIALS. PROBES. REPRINTS. SILICATES. SITES. SURFACES. TOPOLOGY.

HANNEMANN MEDICAL COLL AND HOSPITAL PHILADELPHIA PA DEPT OF PHYSIOLOGY AND BIO PHYSICS

(U) The Role of Central Monoaminergic Systems in Arousal and Selective Attention.

DESCRIPTIVE NOTE: Annual technical rept. 1 Apr 88-31 Jan 89.

JUN 89

PERSONAL AUTHORS: Waterhouse, Barry D.

CONTRACT NO. AFOSR-87-0138

PROJECT NO. 2312

TASK NO. A2

MONITOR: AFOSR  
TR-89-1133

## UNCLASSIFIED REPORT

ABSTRACT: (U) The work described here is part of an ongoing set of studies aimed at characterizing the physiological actions and anatomical organization of the monoaminergic projection systems to the rat cerebral cortex, cerebellum and hypothalamus. The underlying theme of this work is that the endogenous monoamines, norepinephrine (NE) and serotonin (5-HT), serve to modulate central neuronal responsiveness to afferent synaptic inputs and by so doing participate in the cognitive process of selective attention. Individual studies conducted during the past year have investigated: 1) the adrenergic and amino acid receptor specificity of NE-induced facilitation of glutamate efficacy, 2) transmembrane effects of NE on morphologically characterized neocortical neurons and 3) the pharmacological specificity of cocaine actions on single cells in central neuronal circuits. Overall, the data provide further support for the contention that the diffusely distributed monoamine systems of the mammalian brain may enhance the performance of target neuronal circuits as a function of changing behavioral conditions (aw)

DESCRIPTORS: (U) \*COGNITION, \*NOREPINEPHRINE, \*SEROTONIN,

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\*ATTENTION, \*NEUROCHEMISTRY, \*NERVE TRANSMISSION, ANATOMY, BEHAVIOR, BRAIN, CEREBELLUM, CEREBRAL CORTEX, CIRCUITS, COCAINE, GLUTAMIC ACID, HYPOTHALAMUS, MAMMALS, NERVE CELLS, PHYSIOLOGY, RATS, RESPONSE(BIOLOGY), SALTS, STIMULATION(PHYSIOLOGY), CENTRAL NERVOUS SYSTEM.

CALIFORNIA UNIV IRVINE

(U) Synaptic Plasticity and Memory Formation.

DESCRIPTIVE NOTE: Final rept. Apr 86-Mar 89.

IDENTIFIERS: (U) WUAFOSR2312A2, PE61102F, \*Monoaminergic Receptors, Monoamines, Adrenergic Nerves, Amino Acid Receptors, Transmembrane Effects, Neocortical Neurons.

MAY 89

PERSONAL AUTHORS: Lynch, Gary

CONTRACT NO. AFDSR-86-0099

PROJECT NO. 2312

TASK NO. A2

MONITOR: AFOSR  
TR-89-1141

## UNCLASSIFIED REPORT

ABSTRACT: (U) The purpose of the proposed research was to test and elaborate on an hypothesis regarding cellular mechanisms responsible for storing recognition memory in mammalian telencephalon. We proposed that the encoding process involves: 1) an unusual pattern of physiological activity in the relevant neural pathways, 2) influx of calcium into dendritic spines postsynaptic to the active axons, 3) activation of the calcium-sensitive protease, calpain, 4) partial degradation of spectrin, a cytoskeleton protein that regulates membrane surface chemistry and possibly spine shape, and 5) anatomical reorganization of postsynaptic structure resulting in a stable increase of postsynaptic potentials. Central to the hypothesis is the phenomenon of long-term potentiation (LTP) of synaptic transmission; much of the research conducted in the past three years has been aimed at characterizing the physiological and biochemical steps responsible for this remarkably persistent synaptic change and examining its role in memory storage. We have also hypothesized that excessive activation of the calpain system can lead to the neuronal degeneration that is associated with experimental age-related neuropathologies. Keywords: Hippocampus, Learning, Olfactory learning, Spatio-temporal activity, Synaptic plasticity, Glutamate receptors. (aw)

DESCRIPTORS: (U) \*LEARNING, \*MEMORY (PSYCHOLOGY).

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\*SYNAPSE, \*NERVE TRANSMISSION, \*NEUROPHYSIOLOGY,  
\*NEUROCHEMISTRY, ACTIVATION, BIODETERIORATION, CALCIUM,  
CELL STRUCTURE, CODING, CYTOLOGY, DEGRADATION, DENDRITIC  
STRUCTURE, FIBERS, HIPPOCAMPUS, HYPOTHESES,  
MEMBRANES(BIOLOGY), NERVE CELLS, NERVE FIBERS, PATTERNS,  
PHYSIOLOGY, PLASTIC PROPERTIES, PROTEINS, RECOGNITION,  
SHAPE, SMELL, PEPTIDE HYDROLASES, STORAGE, SURFACE  
CHEMISTRY.

IDENTIFIERS: (U) PEG1102F, WUAFOSR2312A2, \*Synaptic  
Plasticity, Telencephalon, Dendritic Spines, Proteases,  
Calpain, Spectrin, Cytoskeleton, Postsynaptic Potentials,  
Long Term Potentiation, LTP(Long Term Potentiation),  
Neuropathology, Neuronal Degeneration, Spatiotemporal  
Activity, Glutamate Receptors.

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JET PROPULSION LAB PASADENA CA

(U) Ion Formation by Electron Impact.

DESCRIPTIVE NOTE: Final rept. 31 May 85-30 Nov 88.

NOV 88

PERSONAL AUTHORS: Srivastava, Santosh K.

CONTRACT NO. AFOSR-ISSA-87-0070, \$AFOSR-ISSA-88-0014

PROJECT NO. 2301

TASK NO. A7

MONITOR: AFOSR

TR-89-1102

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Sponsored in part by Grants AFOSR  
ISSA-85-0070 and AFOSR-ISSA-86-0036.

ABSTRACT: (U) Dissociative attachment and polar  
dissociation cross sections were measured for the  
following molecules: HCl, NO, N2O, C6H6, SiH4, Si2H6, and  
LiH. Direct ionization and dissociative ionization cross  
sections were determined for the following molecules: H2,  
D2, N2, O2, He, Ne, Ar, Kr, Xe, H2O, Co, CO2, CH4, SiH4,  
SiH4, Si2H6, N2\*, and NH3. An experimental apparatus for  
a pulsed extraction technique was fabricated and  
successfully tested. Keywords: Electron impact spectra;  
Hydrogen chloride; Nitrogen oxides; Nitrous oxide;  
Benzene; Silane; Disilane; Lithium hydride; Hydrogen;  
Deuterium; Nitrogen; Oxygen; Helium; Neon; Argon; Krypton;  
Xenon; Water; Carbon monoxide; Carbon dioxide; Methane;  
Ammonia. (JHD)

DESCRIPTORS: (U) \*CHEMICAL DISSOCIATION, \*ELECTRON  
IMPACT SPECTRA, AMMONIA, ARGON, ATTACHMENT, BENZENE,  
CARBON DIOXIDE, CARBON MONOXIDE, CROSS SECTIONS,  
DEUTERIUM, EXTRACTION, HELIUM, HYDROGEN, HYDROGEN  
CHLORIDE, IONIZATION, IONS, KRYPTON, LITHIUM HYDRIDE,  
METHANE, NEON, NITROGEN, NITROGEN OXIDES, NITROUS OXIDE,  
OXYGEN, POLAR REGIONS, PULSES, SILANES, WATER, XENON

IDENTIFIERS: (U) WUAFOSR2301A7, PEG1102F.

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## MATERIALS RESEARCH SOCIETY PITTSBURGH PA

SAN FRANCISCO STATE UNIV CA

(U) Process Diagnostics: Materials, Combustion Fusion.  
Volume 117. Materials Research Society.

(U) Binding of Adenosine Diphosphoribosyltransferase to  
the Termini and Internal Regions of Linear DNAs.

89

DESCRIPTIVE NOTE: Final rept. 6-7 Mar 89.

APR 89 328P

PERSONAL AUTHORS: Sastry, Srinivas S.; Buki, Kalman G;  
Kun, Ernest

PERSONAL AUTHORS: Hays, A. K.; Eckbreth, A. C.; Campbell,  
G. A.

CONTRACT NO. AFOSR-86-0064

CONTRACT NO. DAAL03-88-G-0017, AFOSR-85-0355

MONITOR: ARO, AFOSR  
25361.1-MS-CF, TR-89-1033

PROJECT NO. 2313

TASK NO. A5

MONITOR: AFOSR  
TR-89-1014

## UNCLASSIFIED REPORT

## UNCLASSIFIED REPORT

ABSTRACT: (U) The papers contained in this volume were originally presented at the symposium on Process Diagnostics held at the Spring Meeting of the Materials Research Society. The papers given by the invited speakers in the areas of combustion and fusion were designed to overview major diagnostic techniques (laser-induced fluorescence, spontaneous Raman spectroscopy, interferometry, imaging, Langmuir probes, multiphoton excitation/detection techniques, etc.) as applied to diagnostic papers represent the current state-of-the-art welding, vacuum arc remelting, metal extrusion, and plasma a reference volume for professionals working in the area of for a course in applied spectroscopy or process engineering that might be given as part of a chemistry, physics, chemical or materials engineering curriculum. (AW)

DESCRIPTORS: (U) \*CHEMICAL ENGINEERING, \*COMBUSTION, \*DIAGNOSIS(GENERAL), \*MATERIALS, \*SYMPOSIA, \*PLASMA DIAGNOSTICS, CHEMISTRY, DETECTION, EDUCATION, ENGINEERING, EXCITATION, EXTRUSION, INTERFEROMETRY, LANGMUIR PROBES, LASER INDUCED FLUORESCENCE, METALS, PHOTONS, PHYSICS, RAMAN SPECTROSCOPY, SOCIETIES, SPECTROSCOPY, STATE OF THE ART, VOLUME, WELDING.

IDENTIFIERS: (U) Fusion, Langmuir Probes, Multiphoton  
Excitation Detection Techniques, Vacuum Arc Remelting.

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DESCRIPTORS: (U) \*ADENOSINE, \*DEOXYRIBONUCLEIC ACIDS.

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SUPPLEMENTARY NOTE: Pub. in Biochemistry, v28 p5670-5680  
1989.

ABSTRACT: (U) Adenosine diphosphoribosyltransferase ADPRT; is a specific nuclear protein of higher eucaryotes that has been known primarily as a DNA-dependent enzyme catalyzing the polymerization of ADP-R derived from NAD+ to helical homopolymers that are covalently bound to ADPRT and certain other nuclear proteins. We have recently described a second molecular activity of this enzyme that is only secondarily regulated by the metabolic substrate of ADPRT, which is NAD+, and consists of DNA condensation following the binding of ADPRT to certain circular double-stranded DNAs, an activity that is cooperative with histones. In the present paper we identify the binding of ADPRT to DNA termini with the aid of specific exonucleases by methods that have been tested in other systems (Riley & Wientraub, 1978; Vonder Ahe et al., 1985; Slater et al., 1985; Shalloway et al., 1980; Wu, 1985; Elbrecht et al., 1985). On the other hand, the binding of ADPRT to internal regions of certain restricted double-strand DNAs proved to be more certain restricted double-strand DNAs proved to be more discriminating because it depended on the nature of the restricted DNA fragments. Reprints. (kt)

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ENZYMES, FRAGMENTS, PHOSPHORUS TRANSFERASES, HELIXES,  
HISTONES, INTERNAL, LIMITATIONS, METABOLISM, MOLECULES,  
POLYMERS, REGIONS, REPRINTS, SUBSTRATES.

MINNESOTA UNIV MINNEAPOLIS

(U) Topographic Map Reading.

IDENTIFIERS: (U) PEG1102F, WUAFOSR2312A5, Exonucleases,  
ADPRT.

DESCRIPTIVE NOTE: Final rept. 1 May 88-31 Oct 89.

JUN 89

PERSONAL AUTHORS: Pick, Herbert L.; Thompson, William B.

CONTRACT NO. AFOSR-88-0187

PROJECT NO. 2313

TASK NO. A4

MONITOR: AFOSR  
TR-89-1029

UNCLASSIFIED REPORT

ABSTRACT: (U) Efforts for the second six months of the subject project have continued to focus on determining how expert subjects solve map reading problems. A procedure for collecting and analyzing protocols of expert subjects as they solve problems has been worked out and this is being validated on new subjects. A simulated map reading situation has been developed for laboratory research and this is being exploited to manipulate information available in the map reading situation. Work is also continuing on the characterization of the map readings problem for computational modeling. (JHC)

DESCRIPTORS: (U) \*COMPUTER APPLICATIONS, \*MAP READING,  
\*ARTIFICIAL INTELLIGENCE, COMPUTATIONS, MATHEMATICAL  
MODELS, SIMULATION, TOPOGRAPHIC MAPS.

IDENTIFIERS: (U) Expert Systems, PEG1102F, WUAFOSR2313A4

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VANDERBILT UNIV NASHVILLE TN DEPT OF CHEMISTRY

NEW YORK UNIV N Y DEPT OF PSYCHOLOGY

(U) Experimental and ab Initio Vibrational Spectra of 1,2-Dibromoethane, Meso-1,2-Dideuterio-1,2-Dibromoethane, and Chiral 1,2-Dideuterio-1,2-Dibromoethane.

89

PERSONAL AUTHORS: Bose, P. K.; Henderson, D. O.; Ewig, C. S.; Polavarapu, P. L.

PERSONAL AUTHORS: Sperling, George; Doshier, Barbara A.; Landy, Michael S.

CONTRACT NO. AFOSR-86-0146

CONTRACT NO. AFOSR-88-0140

PROJECT NO. 2303

PROJECT NO. 2313

TASK NO. 83

TASK NO. A5

MONITOR: AFOSR  
TR-89-1018

MONITOR: AFOSR  
TR-89-1037

UNCLASSIFIED REPORT

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Jnl. of Physical Chemistry, v93 n13 p5070-5078 1989.

ABSTRACT: (U) The vibrational spectra of 1,2-dibromoethane and the meso and chiral forms of 1,2-dideuterio-1,2-dibromoethane are presented. The experimental spectra were obtained for neat liquid samples as well as for the molecules isolated in low-temperature matrices. The ab initio calculations of the vibrational frequencies and intensities were carried out with different basis sets. Reprints. (AW)

DESCRIPTORS: (U) \*VIBRATIONAL SPECTRA, \*METHANES, \*BROMINE COMPOUNDS, \*QUANTUM CHEMISTRY, FREQUENCY, LIQUIDS, MOLECULES, REPRINTS, SAMPLING, MOLECULAR VIBRATION, MOLECULAR STRUCTURE, COMPUTATIONS.

IDENTIFIERS: (U) PEG1102F, WUAFOSR230383, Ab Initio Calculations, \*Dibromomethanes, Methane/1-2-Dibromo, Methane/Meso-1-2-Dideuterio-1-2-Dibromo.

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ABSTRACT: (U) Fifty-three different shapes were defined by sequences of 2 D views (frames) of dots on a rotating 3D surface. (1) Subjects' accuracy of shape identifications dropped from over 90% to less than 10% when either the polarity of the stimulus dots was alternated from light-on-gray on successive frames or when neutral gray interframe intervals were interposed. Both manipulations interfere with motion extraction by spatio-temporal (Fourier) and gradient first-order detectors. Second-order (non-Fourier) detectors that use full-wave rectification are unaffected by alternating polarity but disrupted by interposed gray-frames. (2) To equate the accuracy of 2AFC planar direction of motion discrimination in standard and polarity-alternated stimuli, standard contrast was reduced. 3D discrimination survived contrast reduction in standard stimuli whereas it failed completely with polarity-alternation even at full contrast. (3) When individual dots were permitted to remain in the image sequence for only two frames, performance showed little loss compared to standard displays where individual dots had an expected lifetime of 20 frames, showing that 3D shape identification does not require continuity of stimulus tokens. (4) Performance in all discrimination tasks is predicted (up to a monotone transformation) by considering the quality of first-order information (as given by a simple computation on Fourier power) and the number of locations

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at which motion information is required. (JHD)

DESCRIPTORS: (U) \*CONTRAST, \*OPTICAL DETECTORS, \*VISUAL PERCEPTION, \*MOTION, ACCURACY, COMPUTATIONS, CONTINUITY, DEPTH, SHAPE, DISCRIMINATION, DISPLAY SYSTEMS, FOURIER ANALYSIS, FRAMES, GRADIENTS, GRAY(COLOR), OPTICAL IMAGES, KINETICS, LOSSES, MONOTONE FUNCTIONS, NEUTRAL, POLARITY, POWER, QUALITY, REDUCTION, SEQUENCES, SHAPE, STIMULI, TRANSFORMATIONS(MATHEMATICS).

IDENTIFIERS: (U) PE61102F, WUAFUSR2313AS.

CALIFORNIA INST OF TECH PASADENA GRADUATE AERONAUTICAL LABS

(U) Chemical Reactions in Turbulent Mixing Flows.

DESCRIPTIVE NOTE: Final rept. 1 Jan 86-31 Dec 88,

JUN 89

PERSONAL AUTHORS: Dimotakis, Paul E.; Broadwell, James E.; Leonard, Anthony

CONTRACT NO. AFOSR-83-0213

PROJECT NO. 2308

TASK NO. A2

MONITOR: AFOSR  
TR-89-1035

UNCLASSIFIED REPORT

ABSTRACT: (U) The purpose of this research has been to conduct fundamental investigations of turbulent mixing, chemical reaction and combustion processes in turbulent, subsonic and supersonic flows. Progress in this effort thus far has uncovered important deficiencies in conventional modeling of these phenomena, and offered alternative suggestions and formulations to address some of these deficiencies. This program is comprised of an experimental effort, an analytical modeling effort, a computational effort, and a diagnostics development and data-acquisition effort, the latter as dictated by specific needs of our experiments. Our approach has been to carry out a series of detailed theoretical and experimental studies primarily in two, well-defined, fundamentally important flow fields: free shear layers and axisymmetric jets. To elucidate molecular transport effects, experiments and theory concern themselves with both liquids and gases. Modeling efforts have been focused on both shear layers and turbulent jets, with an effort to include the physics of the molecular transport processes, as well as formulations of models that permit the full chemical kinetics of the combustion process to be incorporated. The computational studies are at present focused at fundamental issues pertaining to the computational simulation of both compressible and

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incompressible flows. (aw)

DESCRIPTORS: (U) \*CHEMICAL REACTIONS, \*TURBULENT FLOW, COMBUSTION, COMPRESSIBLE FLOW, COMPUTATIONS, DIAGNOSIS(GENERAL), EXPERIMENTAL DATA, FLOW FIELDS, FORMULATIONS, GASES, INCOMPRESSIBLE FLOW, JET FLOW, LAYERS, MATHEMATICAL MODELS, MIXING, MODELS, MOLECULAR PROPERTIES, PHYSICS, REACTION KINETICS, SHEAR PROPERTIES, SIMULATION, SUPERSONIC FLOW, THEORY, TRANSPORT PROPERTIES.

IDENTIFIERS: (U) WUAFOSR2308A2, PEG1102F.

INSTITUTE FOR THE STUDY OF HUMAN CAPABILITIES  
BLOOMINGTON IN DEPT OF SPEECH AND HEARING SCIENCES

(U) Institute for the Study of Human Capabilities Summary  
Descriptions of Research for the Period September 1988  
through June 1989.

DESCRIPTIVE NOTE: Annual rept. no. 2.

JUN 89

PERSONAL AUTHORS: Watson, Charles S.

CONTRACT NO. AFOSR-87-0089

PROJECT NO. 3484

TASK NO. A4

MONITOR: AFOSR  
TR-89-1028

UNCLASSIFIED REPORT

ABSTRACT: (U) During the second year of its URI/AFOSR support, two new psychophysical testing stations have been completed for use in cross-modality sensory and cognitive research. Initial experiments underway with these systems include a visual detection task with auditory cuing and a tactile-visual identification experiment. The Institute, by these means, has provided partial support of research leading to the publication, during the past year, of 31 journal articles and book chapters, and the presentation of 30 papers at meetings of scientific societies. The Institute has also supported travel by faculty investigators to Air Force research facilities where they participated in discussions of current research projects. Institute investigators gave a series of research presentations to scientists visiting from Wright-Patterson Air Force Base. (SDW)

DESCRIPTORS: (U) \*VISUAL PERCEPTION, \*PSYCHOPHYSIOLOGY, \*COGNITION, AIR FORCE FACILITIES, AIR FORCE RESEARCH, CUEING, DETECTION, HEARING, HUMANS, INSTRUCTORS, SCIENTIFIC ORGANIZATIONS, TRAVEL.

IDENTIFIERS: (U) PEG1102F, WUAFOSR3484A.

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NEW YORK UNIV N Y DEPT OF PSYCHOLOGY

GEORGIA INST OF TECH ATLANTA SCHOOL OF INDUSTRIAL AND  
SYSTEMS ENGINEERING

(U) Two Motion Perception Mechanisms Revealed Through  
Distance-Driven Reversal of Apparent Motion.

(U) Stochastic Flows in Networks.

APR 89

DESCRIPTIVE NOTE: Final technical rept. 16 Feb 88-15 Apr  
89.

PERSONAL AUTHORS: Chubb, Charles; Sperling, George

JUN 89

CONTRACT NO. AFOSR-88-(140

PERSONAL AUTHORS: Serfozo, Richard F.

PROJECT NO. 2313

CONTRACT NO. AFOSR-88-0137

TASK NO. A5

PROJECT NO. 2304

MONITOR: AFOSR

TR-89-1020

TASK NO. A5

UNCLASSIFIED REPORT

MONITOR: AFJSR  
TR-89-1066

SUPPLEMENTARY NOTE: Pub. in Proceedings of the National  
Academy of Sciences of the USA. V86 p2985-2989 Apr 89.

UNCLASSIFIED REPORT

ABSTRACT: (U) Two kinds of visual stimuli are  
demonstrated that exhibit motion in one direction when  
viewed from near and in the opposite direction from afar.  
These striking reversals occur because each kind of  
stimulus is constructed to simultaneously activate two  
different mechanisms: a short-range mechanism that  
computes motion from space time correspondences in  
stimulus luminance and a long-range mechanism in which  
motion computations are performed, instead, on stimulus  
contrast that has been full-wave rectified (e.g., on the  
absolute value of contrast). Reprints. (J4D)

DESCRIPTORS: (U) \*CONTRAST, \*MOTION, \*VISUAL PERCEPTION,  
COMPUTATIONS, LUMINANCE, REPRINTS, RANGE(DISTANCE),  
STIMULI

IDENTIFIERS: (U) PE61102F, WUAFOSR2313A5.

ABSTRACT: (U) This report summarizes research  
accomplishments on stochastic flows in networks. The  
highlight is a new family of probability distributions  
for describing the numbers of units at the nodes in  
partially balanced stochastic networks. Such a  
distribution is a key tool for evaluating the performance  
and design of a network. Another major accomplishment is  
the solution of a long-standing problem of finding an  
expression for the mean time for one unit to move from  
one sector of a network to another sector. We also  
developed several models for concurrent movement of units  
in networks and batch processing at nodes. Keywords:  
Ergodics; Mathematical programming; Probability  
distribution. (KR)

DESCRIPTORS: (U) \*NETWORK FLOWS, \*STOCHASTIC PROCESSES,  
BATCH PROCESSING, LONG RANGE(TIME), ERGODIC PROCESSES,  
MATHEMATICAL PROGRAMMING, MEAN, NETWORKS, NODES,  
PROBABILITY DISTRIBUTION FUNCTIONS, TIME, TOOLS.

IDENTIFIERS: (U) PE61102F, WUAFOSR2304A5.

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TEXAS UNIV AT AUSTIN DEPT OF CHEMISTRY

(U) Aromatic Energies of Some Heteroaromatic Molecules.  
89

PERSONAL AUTHORS: Devar, Michael J.; Holder, Andrew J.

CONTRACT NO. AFOSR-86-0022

PROJECT NO. 2303

TASK NO. B2

MONITOR: AFOSR  
TR-89-1048

## UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Heterocycles, v28 n2 p1135-1155 1989.

ABSTRACT: (U) Heats of formation derived from the AM1 semiempirical method were used to determine the aromatic energies of the following systems: pyrimidine, pyridine, pyridazine, pyrazine, 1,2,4,5-tetraazine, phosphabenzene, 1,2-1,3-1,4-diphosphabenzene, hexaazine, hexaphosphabenzene, silabenzene, thiophene, pyrrole, and furan. Two methods were employed for AE estimates. One used the heats of union of atomic pairs (with elimination of H<sub>2</sub>) of appropriate nonaromatic precursors. The other method used comparison of the heats of hydrogenation of aromatic species to estimate the AE. Reprints. (aw)

DESCRIPTORS: (U) \*AROMATIC COMPOUNDS, \*HETEROCYCLIC COMPOUNDS, \*HEAT OF FORMATION, ENERGY, FURANS, HYDROGENATION, MOLECULES, PYRROLES, REPRINTS, THIOPHENES, PYRIMIDINES, PYRIDINES, PHOSPHAZENE, TETRAZENES, BENZENE, COMPUTATIONS, FURANS.

IDENTIFIERS: (U) PE61102F, WJAFOSR230382, \*Aromatic Energies, Tetrazine/1-2-4-5, Phosphabenzene, Diphosphabenzene, Hexaazines, Hexaphosphabenzene, Silabenzene, Heat Of Hydrogenation.

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CALIFORNIA UNIV SANTA BARBARA DEPT OF ELECTRICAL AND COMPUTER ENGINEERING

(U) Use of Depletion Edge Translation for High-Speed Modulation and Switching of Lightwaves.

DESCRIPTIVE NOTE: Final rept. 1 Mar 88-30 Apr 89.

MAY 89

PERSONAL AUTHORS: Coldren, L. A.

REPORT NO. CU-ECE-TR-89-01

CONTRACT NO. AFOSR-85-0323

PROJECT NO. 2305

TASK NO. B4

MONITOR: AFOSR  
TR-89-1054

## UNCLASSIFIED REPORT

ABSTRACT: (U) We report on our work for the period 1 March 1988 to 28 February 1989. The primary emphasis has been the Fabry-Perot modulator which we introduced in last year's interim report. Over the past year, we have completed the design, optimization and sensitivity analysis for the modulator. Experimentally, we have made good progress in improving the device performance going from a 2:1 on:off ratio to a 25:1 drive to a 10:1 on:off ratio for a 7 V drive. In section V.3 of the present report, we present a brief comparison of our modulator results with those of other groups. With supplemental support from other contracts, we have also made significant advances in fundamental areas which should open new avenues for continued improvement of existing devices and lead to new device structures. We have observed a new effect in superlattices field induced Stark Localization which leads to a blue-shift in absorption edge rather than a conventional red shift. We have also observed optical properties ascribable only to quantum wire effects in quantum wire structures grown directly by molecular beam epitaxy using a process pioneered at UCSB. Both of these new structures should prove to be promising active regions for the Fabry Perot

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device. Additionally, the Fabry-Perot will serve as an excellent vehicle with which to fully characterize the electro-optic properties of these new structures. (rh)

DESCRIPTORS: (U) , ABSORPTION, DEPLETION, EDGES, ELECTROOPTICS, EPITAXIAL GROWTH, FABRY PEROT INTERFEROMETERS, HIGH RATE, MODULATION, MODULATORS, MOLECULAR BEAMS, OPTICAL PROPERTIES, OPTIMIZATION, QUANTUM THEORY, RATIOS, RATIOS, RED(COLOR), REGIONS, SHIFTING, STRUCTURES, TRANSLATIONS, WIRE.

SAN FRANCISCO STATE UNIV TIBURON CA TIBURON CENTER FOR ENVIRONMENTAL STUDIES

(U) Molecular Toxicology of Chromatin.

DESCRIPTIVE NOTE: Final progress rept. Jan 85-Jul 89.

JUL 89

PERSONAL AUTHORS: Kun, Ernest

CONTRACT NO. AFOSR-86-0064

PROJECT NO. 2312

TASK NO. A5

MONITOR: AFOSR  
TR-89-1013

UNCLASSIFIED REPORT

ABSTRACT: (U) During the tenure of this grant period, extending previous studies, a novel physiological regulatory function of a specific DNA binding nuclear protein, ADPRT, has been uncovered, which can explain its cell physiological role as a gene regulator by way of topological modification of DNA structure. The relevance of this approach to the general theme of chromatin toxicology consists in the fact that subtle cellular responses to environmental and genetic factors do not necessarily lead only to a short term lethal outcome, but may result in sustained alteration of gene expression, leading to degenerative diseases and cancer. It was assumed that an understanding of molecular mechanisms that lead to these conditions will allow us to develop molecular pharmacological means to prevent or reverse pathophysiological processes. Results obtained during this research period provide evidence that supports above prediction. Notably the inhibition of malignant growth by specific ligands of ADPRT (185, 191) lead to a molecular pharmacological approach to the control of neoplasia and more recently of DNA- and retro-viral DNA synthesis. (KT)

DESCRIPTORS: (U) \*CANCER, \*CHROMATIN, \*NEOPLASMS, \*TOXICOLOGY, CELLS, DEOXYRIBONUCLEIC ACIDS, GENES, GENETICS, INHIBITION, LIGANDS, MODIFICATION, CHEMOTHERAPEUTIC AGENTS, MOLECULAR PROPERTIES, MOLECULES.

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PATHOLOGY, PHARMACOLOGY, PHYSIOLOGICAL EFFECTS,  
PHYSIOLOGY, REGULATORS, RESPONSE, REVERSIBLE, TOPOLOGY.

PENNSYLVANIA STATE UNIV UNIVERSITY PARK DEPT OF  
MECHANICAL ENGINEERING

IDENTIFIERS: (U) WUAFOSR2312A5, PE61102F, ADPRT.

(U) Analytical Study of Mistuning/Friction/Aerodynamics  
Interaction in a Bladed Disk Assembly.

DESCRIPTIVE NOTE: Final rept. May 87-Jan 89.

FEB 89

PERSONAL AUTHORS: Sinha, Alok; Chen, Shing

CONTRACT NO. AFOSR-87-0142

PROJECT NO. 2302

TASK NO. B1

MONITOR: AFOSR  
TR-89-1059

UNCLASSIFIED REPORT

ABSTRACT: (U) The analytical technique is shown to be valid for the computation of the statistics of blade's vibratory amplitude when the distributions of modal parameters of a mistuned bladed disk assembly are non-gaussian. The results from the analytical technique are compared with those from numerical simulations for triangular and uniform distributions. It was found that the probability density function of the amplitude is insensitive to the types of mistuning distributions. Next, an analytical technique was developed to efficiently compute the probability density function of the maximum amplitude on a mistuned bladed assembly. This technique uses the direct Taylor series expansion in terms of the perturbation in an amplitude as a function of perturbations in modal stiffnesses. The validity of the techniques has been corroborated by comparison with the results from numerical simulations. Lastly, the statistic of the forced response of a structurally and aerodynamically coupled bladed disk assembly were computed efficiently by the analytical technique. The results from the analytical technique agree well with those from numerical simulations. The effects of the following parameters on the statistics of the maximum amplitude were studied; for the aerodynamic couplings among blades, the fluid density and the cascade stagger

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angle. Keywords: Cascade structures; Subsonic flow; Turbine blades. (edc)

NEW YORK UNIV N Y DEPT OF PSYCHOLOGY

DESCRIPTORS: (U) \*CASCADE STRUCTURES, \*TUNING, \*TURBINE BLADES, \*VIBRATION, AERODYNAMICS, AMPLITUDE, ASSEMBLY, BLADES, COUPLING(INTERACTION), DENSITY, DISKS, STATISTICAL DISTRIBUTIONS, EXPANSION, FLUIDS, FRICTION, INTERACTIONS, STATISTICAL ANALYSIS, NUMERICAL ANALYSIS, PARAMETERS, PERTURBATIONS, PROBABILITY DENSITY FUNCTIONS, RESPONSE, SUBSONIC FLOW, TAYLORS SERIES, VALIDATION.

(U) Ratings of Kinetic Depth in Multi-Dot Displays,

89

PERSONAL AUTHORS: Sperling, George; Doshier, Barbara A.; Landy, Michael S.

CONTRACT NO. AFOSR-88-0140

IDENTIFIERS: (U) Mistuning, PEG1102F, WUAFOSR2302B1.

PROJECT NO. 2313

TASK NO. A5

MONITOR: AFOSR  
TR-89-1057

UNCLASSIFIED REPORT

ABSTRACT: (U) Subjects viewed kinetic depth displays whose shape (sphere or cylinder) was defined by luminous dots distributed randomly on the surface or throughout the volume of the object. Subjects rated the amount of perceived 3D depth, rigidity, and coherence. (Coherence is high when all the dots are perceived as a single object.) There were significant individual variations in ratings but, on the whole, all three ratings increased with the number of dots. Luminance of dots had no effect on any of the ratings. Points within the volume yielded ratings equal to or greater than surface points. Each of the three ratings varied with a least 3 of the 4 factors (shape, distribution, numerosity, and perspective), but the ratings did not necessarily covary either between trials or between conditions-often they were uncorrelated or negatively correlated. For example, object shape affected ratings of rigidity but not of depth; when perceived vertically, polar perspective displays were rated slightly less rigid than parallel projection displays but they received higher depth ratings. (When perceived in reversed perspective, polar displays were grossly nonrigid, independent of the other factors.) The complex but understandable interplay of stimulus parameters and ratings forces a examination of previous experimental results and theories in which different KDE ratings were treated interchangeably.

DESCRIPTORS: (U) \*DISPLAY SYSTEMS, \*VISUAL PERCEPTION,

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DEPTH, KINETICS, LUMINANCE, PARALLEL ORIENTATION,  
PARAMETERS, RATINGS, REVERSIBLE, VISION, THREE  
DIMENSIONAL, RIGIDITY, SHAPE, SPHERES, STIMULI, VERTICAL  
ORIENTATION, VOLUME.

COLORADO UNIV AT BOULDER DEPT OF ELECTRICAL AND COMPUTER  
ENGINEERING

(U) Control and Optimization for Observations of Systems  
Governed by Controlled Partial Differential Equations.

IDENTIFIERS: (U) PE61102F, WUAF0SR2313A5, +Kinetic Depth.

DESCRIPTIVE NOTE: Final rept. 1 Aug 86-15 Dec 88.

MAY 89

PERSONAL AUTHORS: Su, Renjeng

CONTRACT NO. AFOSR-86-0198

PROJECT NO. 2304

TASK NO. A1

MONITOR: AFOSR  
TR-89-1067

UNCLASSIFIED REPORT

ABSTRACT: (U) This project was focused on fundamental issues of modeling and control of flexible structures. Particular problems considered were: patterns of transmission zeroes, sensor placement, robust control, and high-performance control using iterative learning approach. During the grant period a flexible beam control devise for experimental purpose was also developed. With most of the work carried out to the extent of laboratory implementation, the following results were concluded: 1) For flexible structure control the location of transmission zeroes in the mathematical models critically depend on the location of sensors. For flexible beams the movement of zeroes were mapped out for control design; 2) For flexible structures a class of new compensators called generalized lead/lag compensators were developed. Their implementation is very simple with delay elements; and 3) Optimal sensor placement can be based on the robustness of the dynamic observer to parameter uncertainty. A design procedure was developed for this purpose. (kr)

DESCRIPTORS: (U) +CONTROL SYSTEMS, +FLEXIBLE STRUCTURES, +OPTIMIZATION, +PARTIAL DIFFERENTIAL EQUATIONS, COMPENSATORS, DELAY, DETECTORS, DYNAMICS, EMPLACEMENT, ITERATIONS, LEARNING, MATHEMATICAL MODELS, NUMERICAL

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METHODS AND PROCEDURES, OBSERVERS, PARAMETERS, PATTERNS,  
TRANSMITTANCE.

TEXAS UNIV AT AUSTIN DEPT OF CHEMISTRY

(U) DEWAR-PI Study of Electrophilic Substitution in  
Selected Polycyclic Fluoranthene Hydrocarbons.

IDENTIFIERS: (U) PE61102F, WUAFOSR2304A1.

89

PERSONAL AUTHORS: Dewar, Michael J.; Dennington, Roy D.,  
II

CONTRACT NO. AFOSR-86-0022, NSF-CHE87-12022

MONITOR: AFOSR  
TR-89-1050

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Jnl. of the American Chemical  
Society, v111 p3804-3808 1989.

ABSTRACT (U) DEWAR-PI molecular orbital calculations  
are reported for 14 nonalternant polycyclic aromatic  
hydrocarbon derivatives of fluoranthene and for the  
Wheland intermediates (arenium ions) to study  
electrophilic substitution at all the methine groups in  
them. Calculations were also carried out for related  
alternant aromatic hydrocarbons. The species studied were  
indeno-(1,2,3-hi)chrysene, benz(def)indeno(1,2,3-hi)  
chrysene fluoreno(3,2,1,9-defg)chrysene, benz(a)  
aceanthrylene, benz(e)acephenanthrylene, indeno(1,2,3-cd)  
pyrene, fluoreno(9,1,2,3-cdef)chrysene, benz(def)indeno(1,  
2,3-qr)chrysene, dibenz(a,e)aceanthrylene, dibenz(af)  
aceanthrylene, dibenz(e,k)acephenanthrylene, dibenz(a,l)  
aceanthrylene, and benzo(k)fluoranthene, benzo(j)  
fluoranthene, phenanthrene, pyrene, chrysene, benzo(def)  
chrysene, benz(a)anthracene, anthracene, and naphthalene.  
Keywords: Computer programs, Reprints. (AW)

DESCRIPTORS: (U) \*AROMATIC HYDROCARBONS, \*POLYCYCLIC  
COMPOUNDS, \*SUBSTITUTION REACTIONS, ANTHRACENES, COMPUTER  
PROGRAMS, IONS, NAPHTHALENES, PHENANTHRENES, REPRINTS,  
MOLECULAR ORBITALS, COMPUTATIONS, QUANTUM CHEMISTRY,  
BENZYL RADICALS.

IDENTIFIERS: (U) PE61102F, WUAFOSR2303B2, \*Fluoranthene  
Hydrocarbons, \*Electrophilic Substitution Reactions,  
Electrophilic Reactions, Dewar PI Molecular Orbital  
Calculations, Arenium Ions, Methine Groups, Chrysenes.

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Indeno Radicals, Fluoreno Radicals, Aceanthrylenes,  
Acephenanthylenes

STANFORD UNIV CA EDWARD L GINZTON LAB OF PHYSICS

(U) Laser Physics and Laser Techniques.

DESCRIPTIVE NOTE: Final rept.,

JUN 89

PERSONAL AUTHORS: Siegman, A. E.

CONTRACT NO. F49620-86-K-0013

PROJECT NO. 2301

TASK NO. A1

MONITOR: AFOSR  
TR-89-1073

UNCLASSIFIED REPORT

ABSTRACT: (U) Several areas of Laser Physics and Laser Techniques are reported on, including ultrafast physical measurements; the development of a new subpicosecond time-response photodetector; identification and analysis of an important new quantum noise limit for unstable laser oscillators; and useful advances in stable and unstable laser resonator theory. Keywords: Optics; Lasers; Nonlinear optics; Unstable resonators; Excess biuse; Spontaneous emission; Ultrafast photo-detectors; Optical Kerr effect. (Jhd)

DESCRIPTORS: (U) \*LASER APPLICATIONS, \*PHOTODETECTORS, OSCILLATORS, QUANTUM ELECTRONICS, CAVITY RESONATORS, KERR MAGNETOOPTICAL EFFECT, NOISE(ELECTRICAL AND ELECTROMAGNETIC).

IDENTIFIERS: (U) PEG1102F, WUAFOSR2301A1, Subpicosecond time, Laser oscillators, Nonlinear optics, Unstable resonators.

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WEA CAMBRIDGE MA

\*RIGIDITY, \*SPACE SYSTEMS, \*SPACECRAFT, \*STRUCTURAL PROPERTIES, \*WAVE PROPAGATION, COEFFICIENTS, FREQUENCY, FUNCTIONS, MATHEMATICS, NONDESTRUCTIVE TESTING, PROPAGATION, RODS, ROTATION, TIMOSHENKO BEAM, TRANSMITTANCE.

(U) Wave-Mode Coordinate Analysis of 'L' Junction in LSS.

DESCRIPTIVE NOTE: Annual rept. 15 Jan 88-30 Mar 89.

MAR 89

IDENTIFIERS: (U) PE61102F, WUAFOSR2303B1.

PERSONAL AUTHORS: Williams, James H., Jr.; Webb, Derrick S.

PROJECT NO. 2303

TASK NO. B1

MONITOR: AFOSR  
TR-89-1063

UNCLASSIFIED REPORT

ABSTRACT: (U) The propagation of structural disturbances through large space structures is of practical interest in the design and nondestructive evaluation of such large space systems. Many wave propagation analyses of large space structures must consider the reflection and transmission of waves at interconnecting junctions. Using the concepts of wave-mode coordinate analysis, a frequency domain study of wave propagation through an 'L' lattice junction is conducted. Each lattice member is modeled as a combined longitudinal rod and Timoshenko beam. The joint in the assembly is modeled as a rigid mass of negligible geometric extent with mass rotary inertia. In order to determine the input wave-mode vector, the joint coupling matrix is applied to a point along a lattice member which is subjected to externally applied sinusoidal loads. The input wave-mode vector contains a mathematical description of the waves generated by the applied sinusoidal loads. The joint coupling matrix for the rigid joint with mass and rotary inertia is presented and used to obtain the scattering matrix of the 'L' junction. The scattering matrix contains the reflection and transmission coefficients which the incoming waves will encounter as they enter the joint. Finally, the frequency response function of each Fourier transformed state variable of the transmitted waves is presented analytically. (RH)

DESCRIPTORS: (U) \*FREQUENCY RESPONSE, \*INERTIA, \*MASS,

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WISCONSIN UNIV-MADISON DEPT OF CHEMISTRY

(U) Use of 2-D INEPT-INADEQUATE 29Si NMR to Determine Structures of Organosilicon Rings.

89

PERSONAL AUTHORS: Maxka, Jim; Adams, Bruce R.; West, Robert

CONTRACT NO. F49620-88-C-0010

PROJECT NO. 2303

TASK NO. B2

MONITOR: AFOSR  
TR-89-0796

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Jnl. of the American Chemical Society. p3447-3449 1989.

ABSTRACT: (U) The structures of two branched cyclic permethylsilanes have been established by 2d Inept-Inadequate Si NMR spectroscopy. Hexadecamethylcyclooctasilane rearranges with AlCl<sub>3</sub> to 1, 1,3-tris (trimethylsilyl) perthylcyclopentasilene 1 and octadecamethylcyclononasilane rearranges to 1,1,3,3-tetrakis (trimethylsilyl)permethylcyclopentasilane 7. These are the first 2D Si NMR experiments to be reported as well as the first use of 2D Inept-Inadequate spectroscopy for structural determination. Reprints, *Organic chemistry*. (jes)

DESCRIPTORS: (U) \*SILANES, \*CYCLIC COMPOUNDS, \*METHYL RADICALS, DETERMINATION, ORGANIC CHEMISTRY, REPRINTS, RINGS, SPECTROSCOPY, MOLECULAR STRUCTURE, ORGANIC COMPOUNDS, ALUMINUM COMPOUNDS, CHLORIDES, NUCLEAR MAGNETIC RESONANCE.

IDENTIFIERS: (U) PF61102F, WUAFOSR2303B2, Organic Silicon Compounds, Silane/Hexadecamethylcycloocta, Silane/1,1,3,3-Tetrakis(trimethylsilyl) Perthylcyclopenta, Silane/Octadecamethylcyclonona, Nuclear Magnetic Resonance Spectroscopy.

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WISCONSIN UNIV-MADISON DEPT OF CHEMISTRY

(U) Synthesis of the Novel Ring Systems 1,2,3,4-Oxazadisiletidine and 1,3,4,2,5-Dioxazadisiletidine.

89

PERSONAL AUTHORS: Gillette, Gregory R.; Maxka, Jim; West, Robert

CONTRACT NO. F49620-86-C-0010

PROJECT NO. 2303

TASK NO. B2

MONITOR: AFOSR  
TR-89-0797

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in *Angewandte Chemie International Edition* in English, v28 n1 p54-55 Jan 89.

ABSTRACT: (U) The novel organosilicon rings 2 and 3 were synthesized from the reaction of tetramethyldisilene, 1, with nitrosobenzene and nitrobenzene, respectively. The silicon-silicon coupling constants for the adducts 2 and 3 were determined utilizing the Inept-Inadequate pulse sequence as modified for Silicon 29 Nuclear Magnetic Resonance. The values obtained support the proposed cyclic structures. Reprints. (aw)

DESCRIPTORS: (U) \*SYNTHESIS(CHEMISTRY), \*SILICON COMPOUNDS, \*ORGANIC COMPOUNDS, CONSTANTS, COUPLING(INTERACTION), CYCLES, REPRINTS, SILICON, SILICON DIOXIDE, MOLECULAR STRUCTURE, OXYGEN, NUCLEAR MAGNETIC RESONANCE.

IDENTIFIERS: (U) PF61102F, WUAFOSR2303B2, Siletidines, \*Silolidines, Siletidine(d)/1-2-3-4-Oxaza, Silolidine(d)/1-3-4-2-5-Dioxaza.

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CALIFORNIA UNIV SAN DIEGO LA JOLLA DEPT OF CHEMISTRY

MOORE SCHOOL OF ELECTRICAL ENGINEERING PHILADELPHIA PA  
DEPT OF SYSTEMS ENGINEE RING

(U) Tris(trimethylsilyl)silyl Derivatives of Tri-tert-butoxyzirconium and Tri-tert-butoxyhafnium. X-ray Crystal Structure of (Me3CO)3ZrSi(SiMe)3.

89

PERSONAL AUTHORS: Heyn, Richard H.; Tilley, T. D.

CONTRACT NO. AFOSR-88-0473

PROJECT NO. 2303

TASK NO. 82

MONITOR: AFOSR  
TR-89-0816

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Inorganic Chemistry, v28  
p1768-1769 1989

ABSTRACT: (U) By reaction of (Me3CO)3MCL(M=Zr or Hf) with (THF)3LiSi(SiMe3)3, the new silyl complexes(Me3CO)3MSi(SiMe3)3 (M=Zr, 2; M=Hf) have been prepared and characterized. These colorless complexes represent the first group 4 metal silyl derivatives that do not contain ancillary cyclopentadienyl ligands. Crystals of 1 are orthorhombic, Pnma, a=21.48 (1), b=16.850 (8), c=10.033 (5) A, V=3631 (3) Cu, A, Z=4, RF=6.00%. Compound 1 contains the shortest Zr-Si bond yet reported, 2.753 (4) A. Preliminary reactivity studies with 1 and 2 are described. Keywords: Metal complexes; Zirconium compounds; Hafnium compounds; Lithium compounds; Silicon compounds; Carbonyl complexes; Reprints. (aw)

DESCRIPTORS: (U) \*HAFNIUM COMPOUNDS, \*METAL COMPLEXES, \*SILICON COMPOUNDS, \*ZIRCONIUM COMPOUNDS, CRYSTAL STRUCTURE, LITHIUM COMPOUNDS, REACTIVITIES, REPRINTS, X RAYS, METAL CARBONYLS, ORGANOMETALLIC COMPOUNDS, BUTYL RADICALS, OXYGEN

IDENTIFIERS: (U) PE61102F, WUAFOSR230382, Trimethylsilyl Compounds, Silyl Radicals, Zirconium/Tritertbutoxy, Hafnium/Tritertbutoxy, Butoxy Radicals.

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ABSTRACT: (U) Four real-time heuristic algorithms for determining aircraft evasion strategies against a multiple missile threat are described. Algorithms 1 and 2 are based on a myopic saddle-point calculation which apporions the projection of the instantaneous aircraft acceleration among the normals to the individual maneuver or guidance planes defined by each missile and its target. Algorithms 3 and 4 are also based on myopic saddle-point calculations. These latter two algorithms apportion the projection of the instantaneous aircraft acceleration into the individual maneuver planes so as to maximize the minimum of a function which is related to the line of sight rate of each missile threat. These latter two algorithms are motivated by the concept of anti-proportional navigation. Simulation results using each algorithm with generic F-4 and AIM-9 truth models, characterized by nonlinear differential equations, including lift, drag, gravity, 3-dimensional point mass dynamics, aircraft load factor and roll rate limits, and missile autopilot dynamics and load factor limits are presented. All four heuristic algorithms are motivated by a formal game theoretic model for multiple missile evasion. This formal game theoretic analysis is included

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as part of this study. Keywords: Computerized simulation;  
Game theory; Control theory; Mathematical models. (kr)

DESCRIPTORS: (U) \*AIRCRAFT DEFENSE SYSTEMS, \*EVASION,  
\*GAME THEORY, \*HEURISTIC METHODS, \*MOVING TARGETS,  
ACCELERATION, ALGORITHMS, AUTOMATIC PILOTS, COMPUTERIZED  
SIMULATION, CONTROL THEORY, DRAG, DYNAMICS, GRAVITY,  
GUIDED MISSILE COMPONENTS, GUIDED MISSILES, LIMITATIONS,  
LINE OF SIGHT, LOADS(FORCES), MANEUVERS, MATHEMATICAL  
MODELS, MODEL THEORY, NONLINEAR DIFFERENTIAL EQUATIONS,  
RATES, REAL TIME, ROLL, SIMULATION, STRATEGY, THEORY,  
THREATS.

IDENTIFIERS: (U) PE61102F, WUAFOSR2304A1.

AD A211 092 7/2

CINCINNATI UNIV OH DEPT OF CHEMISTRY

(U) Studies of Thiophene and Substituted Thiophenes at  
Platinum (111) Electrodes by Vibrational Spectroscopy  
and Auger Spectroscopy: Monomers, Dimers, and Polymers.

89

PERSONAL AUTHORS: Batina, Nikola; Gul, John Y.; Kahn,  
Bruce E.; Lin, Chiu-Hsun; Lu, Frank

CONTRACT NO. AFOSR-86-0200

PROJECT NO. 2303

TASK NO. A1

MONITOR: AFOSR  
TR-89-0932

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Langmuir, v5 n3 p588-600 1989.  
Presented at the Symposium on Adsorption on Solid  
Surfaces, Colloid and Surface Science Symposium (62nd),  
State College, PA, 19-22 Jun 88.

ABSTRACT: (U) The adsorption behavior of various  
thiophenes from organic as well as aqueous solutions at  
well-defined Pt(111) surfaces is examined in this study.  
The adsorbates studied include 3-thiophenecarboxylic acid  
(3TCA), 2-thiophenecarboxylic acid (2TCA), 3-  
thiophenecarboxylic acid (3TAA), 2-thiophenecarboxylic acid  
(2TAA), thiophene (TPE), 3-methylthiophene (3MT), 3,3'-  
dimethyl-2,2-bithiophene (33 DMBT), and 4,4-dimethyl-2,2-  
bithiophene (44 DMBT). Packing Densities (moles absorbed  
per unit area) were measured for each compound by Auger  
spectroscopy. Surface vibrational spectra were obtained  
by electron energy loss spectroscopy (EELS) and were  
assigned by comparison with the IR spectra of the pure  
compounds. The Pt(111) surfaces used in this study were  
characterized by LEED. All the thiophenes studied are  
adsorbed with the ring plane nearly perpendicular to the  
platinum surface. Vibrational spectra of  
thiophenecarboxylic acids, and the dependence of  
adsorption on electrode potential, give valuable  
information about the adsorbate structure. Reprints (jes)

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DESCRIPTORS: (U) \*ADSORPTION, \*THIOPHENES, \*SURFACE CHEMISTRY, ACIDS, AUGER ELECTRON SPECTROSCOPY, ELECTRODES, ELECTRON ENERGY, ELECTRON SPECTROSCOPY, LOSSES, MONOMERS, PACKING DENSITY, PLATINUM, POLYMERS, PURITY, REPRINTS, RINGS, SOLUTIONS(MIXTURES), SPECTROSCOPY, SUBSTITUTES, SURFACES, VIBRATIONAL SPECTRA, WATER, DIMERS, CARBOXYLIC ACIDS, ACETIC ACID, METHYL RADICALS.

PITTSBURGH UNIV PA SURFACE SCIENCE CENTER

(U) Carbon Monoxide-Oxygen Interaction on the Pt(111) Surface: An Electron Stimulated Desorption Ion Angular Distribution (ESDIAD) Study,

APR 89

IDENTIFIERS: (U) PEB1102F, WUAFOSR2303A1, Thiophenecarboxylic Acids, Carboxylic Acid/2-Thiophene, Carboxylic Acid/3-Thiophene, Methylthiophenes, Thiophene/3-Methyl, Thiopheneacetic Acids, Acetic Acid/3-Thiophene, Acetic Acid/2-Thiophene, Thiophene(bi)/3-3-Dimethyl-2-2, Thiophene(bi)/4-4-Dimethyl-2-2.

PERSONAL AUTHORS: Szabo, A.; Kiskinova, M.; Yates, J. T. Jr

CONTRACT NO. AFOSR-82-0133

PROJECT NO. 2303

TASK NO. A2

MONITOR: AFOSR  
TR-89-0793

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Jnl. of Chemical Physics, v90 n8 p4604-4612 1989.

ABSTRACT: (U) CO adsorption on the p(2x2)O-Pt(111) surface was studied by the digital ESDIAD (electron stimulated desorption ion angular distribution) method in combination with TPD< Leed, and work function measurements. Three ESD products were detected: CO, O, and metastable CO>. The ESDIAD patterns of each of these species were measured. The most significant difference in the ESD behavior of chemisorbed CO on the oxygen covered surface from that of CO adsorbed on clean platinum surface was found at low CO coverages. This indicates that there is no preferential adsorption on the surface sites unaffected by oxygen. A small tilting of CO was found. Keywords: Chemisorption, Carbon Monoxide, Oxygen, Platinum, Electron Stimulated Desorption, Reprint (JES)

DESCRIPTORS: (U) \*ADSORPTION, \*CARBON MONOXIDE, \*OXYGEN, \*SURFACE CHEMISTRY, CHEMISORPTION, DESORPTION, ELECTRONS, PLATINUM, REPRINTS, SITES, STIMULATION(GENERAL), SURFACES, WORK FUNCTIONS, MEASUREMENT.

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WASHINGTON UNIV SEATTLE

(U) Mapping the Wind in the Polar Thermosphere: A Case Study within the CEDAR (Coupling, Energetics and Dynamics of Atmospheric Regions) Program.

MAR 89

PERSONAL AUTHORS: Smith, Roger W.; Meriwether, John W., Jr.; Hernandez, Gonzalo; Rees, David; Wickwar, Vincent

CONTRACT NO. AFOSR-87-0174

PROJECT NO. 2310

TASK NO. A2

MONITOR: AFOSR  
TR-89-0803

## UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in EOS Transactions, American Geophysical Union, v70 p161-169, 21 Mar 89.

ABSTRACT: (U) The purpose of this paper is to present one part of the CEDAR program which illustrates the power of the combination of full vector wind data from several data sites in the northern arctic. A special, internationally coordinated campaign was organized for the 4-day period January 14-17, 1986. This campaign had a global distribution of 22 possible optical stations and six possible radars specially organized to participate covering both hemispheres. Ionosonde stations were also alerted to the existence of the special period. This paper concentrates on the dynamics of the high-latitude regions using the optical wind data and the radar ion drifts to study the situation. Keywords: Polar atmosphere dynamics; Polar atmosphere emission; Polar atmosphere motions; Reprints. (Jhd)

DESCRIPTORS: (U) \*METEOROLOGICAL DATA, \*THERMOSPHERE, \*WIND, ARCTIC REGIONS, DRIFT, DYNAMICS, EMISSION, ENERGETIC PROPERTIES, HIGH LATITUDES, IONOSPHERES, IONS, OPTICAL DATA, OPTICAL PROPERTIES, POLAR REGIONS, RADAR, REGIONS, REPRINTS, STATIONS, VECTOR ANALYSIS.

IDENTIFIERS: (U) CEDAR Program, PE61102F, WUAFOSR2310A2

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MIAMI UNIV CORAL GABLES FLA DEPT OF MECHANICAL ENGINEERING

(U) International Conference on Numerical Grid Generation in Computational Fluid Dynamics.

DESCRIPTIVE NOTE: Final rept. 1 Dec 87-30 Apr 89.

APR 89

PERSONAL AUTHORS: Sengupta, Subrata

CONTRACT NO. AFOSR-88-0082

PROJECT NO. 2304

TASK NO. A3

MONITOR: AFOSR  
TR-89-1070

## UNCLASSIFIED REPORT

ABSTRACT: (U) The International Conference series on Numerical Grid Generation in Computational Fluid Dynamics was started in July 1986 to recognize grid generation as an essential subject of Computational Fluid Dynamics which needs individual attention. The conference is held bi-annually with the purpose of disseminating new ideas, recent advances and difficulties encountered by researchers around the world while solving practical Computational Fluid Dynamics problems. The second conference in the series was held in Miami, Florida, USA, during the week of December 5-9, 1988. The main theme of the conference was 2-D and 3-D adaptive grid methods. Nevertheless, papers were invited from all relevant conventional areas such as algebraic, boundary fit, and conformal mapping methods and other areas including applications in computational mechanics. (KR)

DESCRIPTORS: (U) \*FLUID DYNAMICS, \*GRIDS, \*NUMERICAL ANALYSIS, COMPUTATIONS, CONFORMAL MAPPING, DISTRIBUTION, FLORIDA, INTERNATIONAL, MECHANICS, METHODOLOGY, SYMPOSIA

IDENTIFIERS: (U) WUAFOSR2304A3, PE61102F.

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AD-A211 068 7/4

VERMONT UNIV BURLINGTON DEPT OF COMPUTER SCIENCE AND ELECTRICAL ENGINEERING

MICHIGAN STATE UNIV EAST LANSING DEPT OF MATHEMATICS

(U) Electromagnetic Pulse Interaction at a Dielectric Interface.

(U) Solidation Front/Viscous Phase Transitions, Forwards Backward Heat Equations.

DESCRIPTIVE NOTE: Final rept. 1 Mar 88-28 Feb 89.

DESCRIPTIVE NOTE: Final rept. 1 Jun 87-28 Feb 89.

APR 89

JUL 89

PERSONAL AUTHORS: Oughstun, Kurt E.

PERSONAL AUTHORS: Novick-Cohen, Amy

CONTRACT NO. AFOSR-88-0149

CONTRACT NO. AFOSR-87-0267

PROJECT NO. 2304

PROJECT NO. 2304

TASK NO. A4

TASK NO. A9

MONITOR. AFOSR

MONITOR: AFOSR TR-89-1064

TR-89-1069

UNCLASSIFIED REPORT

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ABSTRACT: (U) The research on pulsed electromagnetic beam fields is nearing completion with some rather interesting results. In particular, the rigorous angular spectrum representation of pulsed beam fields has been found to differ from the given by the simpler plane-wave spectrum representation. This latter formulation (as given by W.H. Carter), 'Electromagnetic Beam Fields', Optica Acta, 21, 87-892 (1974) assumes the form of the propagated transverse field components for either the electric or magnetic field vector and then solves the Maxwell field equation for the remaining field components in a self-consistent manner. The rigorous derivation for a general pulsed electromagnetic beam field clearly shows that this assumption is valid only for very special cases of the spatial field distribution and polarization state. (rh)

DESCRIPTORS: (U) \*PHASE TRANSFORMATIONS, SOLIDIFICATION, HEAT TRANSFER, DIFFUSION.

DESCRIPTORS: (U) \*BEAMS(ELECTROMAGNETIC), \*DIELECTRICS, \*ELECTRIC FIELDS, \*ELECTROMAGNETIC FIELDS, \*ELECTROMAGNETIC PULSES, \*ELECTROMAGNETIC RADIATION, \*INTERACTIONS, \*INTERFACES, \*MAGNETIC FIELDS, ANGLES, POLARIZATION, PULSES, SPATIAL DISTRIBUTION, SPECTRA, TRANSVERSE.

IDENTIFIERS: (U) WUAFOSR2304A1, PE61102F.

IDENTIFIERS: (U) Sivashinsky equation, Cahn Hilliard equation, WUAFOSR2304A9, PE61102F.

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AD-A211 063 23/3 12/7

TEXAS UNIV AT AUSTIN DEPT OF CHEMISTRY

NEW YORK UNIV N Y DEPT OF PSYCHOLOGY

(U) AM1 Calculations for Compounds Containing Germanium.

(U) Drift-Balanced Random Stimuli: A General Basis for Studying Non-Fourier Motion Perception.

89

NOV 88

PERSONAL AUTHORS: Devar, Michael J.; Jie, Caoxian

PERSONAL AUTHORS: Chubb, Charles; Sperling, George

CONTRACT NO. AFOSR-86-0022, NSF-CHE87-12022

CONTRACT NO. AFOSR-88-0140

PROJECT NO. 2303

PROJECT NO. 2313

TASK NO. B2

TASK NO. A5

MONITOR: AFOSR  
TR-89-1049MONITOR: AFOSR  
TR-89-1022

UNCLASSIFIED REPORT

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Organometallics, v8 n6 p1544-1547 1989.

SUPPLEMENTARY NOTE: Pub. in Jnl. of the Optical Society of America A, v5 n11 p1986-2007 Nov 88.

ABSTRACT: (U) Now that germanium is readily available as a result of its importance in electronics, increasing attention is being paid to its chemistry. As a result, there is a growing need for a practical theoretical procedure for studying the behavior of germanium compounds. Am1 has been parametrized for germanium. Calculations are reported for a number of compounds of germanium. The results are generally superior to those from MNDO, especially in geometries. Reprints. (AW)

DESCRIPTORS: (U) \*GERMANIUM COMPOUNDS, \*QUANTUM CHEMISTRY, CHEMISTRY, ELECTRONICS, GERMANIUM, REPRINTS, COMPUTATIONS.

IDENTIFIERS: (U) PE61102F, WUAFOSR2303B2, AM1 Calculations, MNDO(Modified Neglect of Differential Overlap).

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time. Examples are provided of classes of microbalanced random stimuli that display consistent and compelling motion in one direction. All the results and examples from the domain of motion perception are transposable to the space-domain problem of detecting orientation in a texture pattern. Reprints. (JHD)

CALIFORNIA UNIV SAN DIEGO LA JOLLA DEPT OF PSYCHIATRY

(U) Extrathalamic Modulation of Cortical Function.

DESCRIPTIVE NOTE: Interim rept. 1 Apr 88-31 Mar 89.

JUL 89

DESCRIPTORS: (U) \*MOTION, \*VISUAL PERCEPTION, DRIFT, FREQUENCY, MODELS, PATTERNS, REPRINTS, SPATIAL DISTRIBUTION, STIMULI, TEXTURE, VISUAL SIGNALS.

PERSONAL AUTHORS: Foote, Stephen L.

CONTRACT NO. F49620-87-C-0038

PROJECT NO. 2312

TASK NO. A2

MONITOR: AFOSR  
TR-89-1012

IDENTIFIERS: (U) Reichardt Detectors, PE61102F,  
WUAFOSR2313A5.

UNCLASSIFIED REPORT

ABSTRACT: (U) The focus of the research is to understand the role that the widely-divergent, globally-acting locus coeruleus (LC)-noradrenergic (NA) system plays in sensory information processing. Completed light-microscopic studies of the regional and laminar distribution of cortical innervation by extrathalamic systems (e.g., noradrenergic, cholinergic, serotonergic, and dopaminergic) indicate that axons of each system exhibit a different density and laminar distribution. They also display individual developmental sequences in terms of the time innervation begins and the evolution of its specialized laminar distribution in each cortical region. These anatomic data support the proposal that each extrathalamic system contacts a distinct population of neurons in specific cortical regions. Each population of neurons may be involved in different aspects of cortical regions. Cellular electrophysiology studies suggest that activity in the LC-NA has specific modulatory effects on the sensory responsiveness of cortical neurons. It alters the excitatory and inhibitory components of these sensory responses. Functionally, the LC-NA system may be involved in the orienting and attentional mechanisms. Keywords: Event related potential, Drugs, Visual perception, Auditory perception, Electroencephalography, Lesions, Nucleus. (aw)

DESCRIPTORS: (U) \*ELECTROPHYSIOLOGY, \*INFORMATION

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PROCESSING, \*NERVE CELLS, \*NERVE TRANSMISSION, \*CEREBRAL CORTEX, ANATOMY, AUDITORY PERCEPTION, DISTRIBUTION, DRUGS, ELECTROENCEPHALOGRAPHY, INHIBITION, LAMINAR FLOW, LESIONS, NERVE FIBERS, POPULATION, RESPONSE(BIOLOGY), SENSES(PHYSIOLOGY), VISUAL PERCEPTION, THALAMUS, EXTERNAL, CHOLINERGIC NERVES.

MASSACHUSETTS UNIV AMHERST

(U) Biological Investigations of Adaptive Networks: Neuronal Control of Conditioned Responses.

DESCRIPTIVE NOTE: Final rept. 1 Jun 86-18 Jul 89,

IDENTIFIERS: (U) WUAFOSR2312A2, PE61102F, Locus Coeruleus, Noradrenergic Receptors, Serotonergic Receptors, Dopaminergic Receptors.

JUL 89

PERSONAL AUTHORS: Moore John W.

CONTRACT NO. AFOSR-86-0182

PROJECT NO. 2312

TASK NO. A1

MONITOR: AFOSR  
TR-89-1016

UNCLASSIFIED REPORT

ABSTRACT: (U) Investigations of adaptive neural networks were conducted using the classically conditioned nictitating membrane response (NMR) of rabbit. Work involved both neurobiological and theoretical approaches based on mathematical models and computer simulation. Recordings were done from single brain stem neurons in awake, behaving animals for the purpose of determining the loci and activity relate to CRs. Computational tools for applying systems analysis to neurophysiological data obtained from single-unit recordings from awake behaving animals were developed. The relationship between single neurons' dynamic behavior and the CR in terms of differential equations and sophisticated correlational analyses based on Fourier and Laplace transform methods was characterized. Theoretical studies revolved around two mathematical models of learning. The Sutton-Barto-Desmond (SBD) model was designed to describe real-time features of the NM CR. A cerebellar network implementation of this model was constructed by combining parametric constraints of the model dictated by behavioral data with constraints based on anatomy and physiology of the cerebellum. The second major theoretical development was the construction of a two element neural-network architecture that elegantly describes adaptive timing as manifested in the fine grain temporal characteristics of CRs. (aw)

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MILTON S HERSHEY MEDICAL CENTER PA

DESCRIPTORS: (U) \*ADAPTIVE SYSTEMS, \*NERVE CELLS,  
\*NEUROPHYSIOLOGY, \*RESPONSE(BIOLOGY), ANATOMY, ANIMALS,  
BEHAVIOR, BIOLOGY, BRAIN, CEREBELLUM, COMPUTATIONS,  
COMPUTERIZED SIMULATION, CONTROL, DIFFERENTIAL EQUATIONS,  
DYNAMIC RESPONSE, FOURIER ANALYSIS, LAPLA E  
TRANSFORMATION, LEARNING, MATHEMATICAL MC ELS, NETWORKS,  
NEUTRAL, PHYSIOLOGY, RABBITS, SYSTEMS ANALYSIS, THEORY.

(U) Slope-Controlled Performance Testing.

DESCRIPTIVE NOTE: Final rept. 15 Jun 87-30 Sep 88,

JUL 89

PERSONAL AUTHORS: Jones, Marshall B.

CONTRACT NO. AFOSR-87-0216

PROJECT NO. 2313

TASK NO. A7

MONITOR: AFOSR  
TR-89-1031

UNCLASSIFIED REPORT

ABSTRACT: (U) Cognitive ability tests, though promising in other respects, often show pronounced practice effects and have weak test-retest reliabilities. One reason for the low reliabilities appears to be that practice effects themselves vary from individual to individual, so that subjects differ not only in the levels at which they are performing when testing ends but also in the slopes leading up to those levels. Since slope of the performance curve late in practice has been shown to affect performance at reacquisition (retest), uncontrolled variation in slope may lower test-retest reliability. A possible approach to this problem is experimentally to control slope during testing so that all subjects are improving at roughly the same rates when testing ends. Under this treatment testing (practice) is continued until an individual's improvement from the just preceding to the last block of trials drops below a critical value; at this point testing stops. Individual subjects vary in both level of performance at the end of testing and number of test blocks, but they are all roughly comparable in the slopes of their performance curves at the end of testing (acquisition). Keywords: Standard deviation. (KR)

DESCRIPTORS: (U) \*APTITUDE TESTS, \*PERFORMANCE TESTS,  
\*SLOPE, ACQUISITION, COGNITION, CONTROL, GRAPHS, STANDARD  
DEVIATION, TEST AND EVALUATION, VARIATIONS

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NORTH CAROLINA UNIV AT CHAPEL HILL DEPT OF MATHEMATICS

IDENTIFIERS: (U) PEG1102F, WUAFOSR2313A7.

(U) Parameter Estimation in Functional and Partial  
Differential Equations.

DESCRIPTIVE NOTE: Final rept. 1 Sep 86-30 Apr 89.

MAY 89

PERSONAL AUTHORS: Murphy, Katherine A.

CONTRACT NO. AFOSR-86-0256

PROJECT NO. 2304

TASK NO. A1

MONITOR: AFOSR  
TR-89-1068

UNCLASSIFIED REPORT

ABSTRACT: (U) This grant supported research in parameter estimation in distributed parameter systems, the research focused on theoretical and computational methods for estimation of unknown variable parameters in nonlinear partial differential equations. Also methods for estimating time delays in functional differential equations and boundary parameters in moving boundary problems were developed. Seven publications were produced under this grant, including 'Estimation of discontinuous coefficients and boundary parameters for hyperbolic systems' and 'Estimation of time - and state - dependent delays and other parameters in functional differential equations.' Keywords: Algorithms; Differential equations; Approximation theory.

DESCRIPTORS: (U) \*PARAMETRIC ANALYSIS, \*ESTIMATES, ALGORITHMS, APPROXIMATION(MATHEMATICS), BOUNDARIES, BOUNDARY VALUE PROBLEMS, COEFFICIENTS, DELAY, DIFFERENTIAL EQUATIONS, DISTRIBUTION, FUNCTIONAL ANALYSIS, MOTION, NONLINEAR DIFFERENTIAL EQUATIONS, NUMERICAL METHODS AND PROCEDURES, PARAMETERS, PARTIAL DIFFERENTIAL EQUATIONS, THEORY, TIME, TIME INTERVALS, VARIABLES.

IDENTIFIERS: (U) PEG1102F, WUAFOSR2304A1, Functional Equations.

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TEXAS UNIV AT AUSTIN DEPT OF CHEMISTRY

AT AND T BELL LABS MURRAY HILL NJ

(U) AM1 Parameters for Phosphorus,

(U) An Investigation into the Effects of Peptide Neurotransmitters and Intracellular Second Messengers in Rat Central Neurons in Culture.

89

PERSONAL AUTHORS: Dewar, Michael J.; Jie, Caoxian

DESCRIPTIVE NOTE: Final rept. Oct 84-Feb 89.

CONTRACT NO. AFOSR-89-0179

JUN 89

PROJECT NO. 2303

PERSONAL AUTHORS: Connor, John A.

TASK NO. 82

CONTRACT NO. F49620-85-C-0009

MONITOR: AFOSR  
TR-89-1025

PROJECT NO. 2312

TASK NO. K2

MONITOR: AFOSR  
TR-89-1030

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Jnl. of Molecular Structure (Theochem), v187 p1-13 1989.

UNCLASSIFIED REPORT

ABSTRACT: (U) AM1 has been parametrized for phosphorus. Calculations are reported for an extensive series of phosphorus-containing compounds. Although d ADs are not included in the basis set, the results are satisfactory for both trivalent and pentavalent phosphorus. Keywords: Inorganic chemistry; Reprints; Organic chemistry; Molecular structure. (KT)

ABSTRACT: (U) Studies addressing the interrelationship between intracellular messengers and neurotransmitters have been conducted on four types of nerve cell preparations from the mammalian central nervous system and from molluscan neurons using electrophysiological and high resolution digital imaging techniques. Preparations utilized were primary cell cultures from embryonic rat diencephalon and cerebellum, acutely dissociated neurons from the hippocampus of adult guinea pig, and brain slices from the cerebellum of adult guinea pig. Major research accomplishments are listed. 1) First measurements of calcium ion levels in living functional growth cones of mammalian and molluscan neurons and the demonstration of an optimum range of intracellular calcium promotes outgrowth. 2) First reported measurements of membrane conductances in granule neurons of the cerebellum and study of the developmental time course of these conductances. 3) First demonstration of persisting modulation of intracellular calcium levels by brief applications of neurotransmitters glutamate and GABA in Purkinje and granule neurons of the rat cerebellum. 4) First measurements of changes in free calcium levels produced by excitatory amino acid neurotransmitters in the dendrites of hippocampal neurons, a focus of research on memory mechanism. 5) First

DESCRIPTORS: (U) \*PHOSPHORUS, INORGANIC CHEMISTRY, MOLECULAR STRUCTURE, ORGANIC CHEMISTRY, PHOSPHORUS COMPOUNDS, REPRINTS.

IDENTIFIERS: (U) PE61102F, WUAFOSR2303B2, \*AM1.

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measurements of calcium levels and oscillations in neurons in the brain slice. 6) The development of membrane conductances and responsiveness to neurotransmitters and of expression of cell specific antigens has been studied in cerebellar Purkinje neurons in culture and in vivo. (KT)

DESCRIPTORS: (U) \*NERVE CELLS, \*NEUROMUSCULAR TRANSMISSION, \*PEPTIDES, ADDRESSING, ADULTS, AMINO ACIDS, BRAIN, CALCIUM, CELLS(BIOLOGY), CENTRAL NERVOUS SYSTEM, CEREBELLUM, CONDUCTIVITY, CONICAL BODIES, CULTURES(BIOLOGY), DEMONSTRATIONS, DENDRITIC STRUCTURE, GLUTAMIC ACID, GROWTH(GENERAL), GUINEA PIGS, HIPPOCAMPUS, IN VIVO ANALYSIS, IONS, LIFE(BIOLOGY), MAMMALS, MEASUREMENT, MEMBRANES(BIOLOGY), MEMORY DEVICES, MODULATION, OPTIMIZATION, OSCILLATION, PREPARATION, RATS, RESPONSE(BIOLOGY), SALTS.

IDENTIFIERS: (U) WUAFOSR2312K2, PE61102F, Purkinje neurons.

AD-A211 028 23/3

NEW YORK UNIV N Y DEPT OF PSYCHOLOGY

(U) Second-Order Motion Perception: Space/Time Separable Mechanisms,

89

PERSONAL AUTHORS: Sperling, George

CONTRACT NO. AFOSR-88-0140

PROJECT NO. 2313

TASK NO. A5

MONITOR: AFOSR  
TR-89-1023

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Proceedings Workshop on Visual Motion, p126-138 1989.

ABSTRACT: (U) Microbalanced stimuli are dynamic displays which do not stimulate motion mechanisms that apply standard (Fourier-energy or autocorrelational) motion analysis directly to the visual signal. Because they bypass such first-order mechanisms, microbalanced stimuli are uniquely useful for studying second-order motion perception (motion perception served by the mechanisms that require a grossly nonlinear stimulus transformation prior to standard motion analysis). Some stimuli are microbalanced under all pointwise stimulus transformations and therefore are immune to early visual nonlinearities. These are used to disable motion information derived from spatial (temporal) filtering in order to isolate the temporal (spatial) properties of space/time separable second-order motion mechanisms. The motion of all of the microbalanced stimuli one considers can be extracted by (1a) band-selective spatial filtering and (1b) biphasic temporal filtering, nonzero in dc, followed by (2) a rectifying nonlinearity and (3) standard motion analysis. Reprints. (jhd)

DESCRIPTORS: (U) \*VISUAL PERCEPTION, \*MOTION, DISPLAY SYSTEMS, DYNAMICS, NONLINEAR SYSTEMS, OPTICAL IMAGES, REPRINTS, SEPARATION, STIMULI, AUTOCORRELATION, SPATIAL FILTERING, TRANSFORMATIONS, VISUAL SIGNALS.

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TEXAS UNIV AT AUSTIN DEPT OF CHEMISTRY

IDENTIFIERS: (U) Biphasic Temporal Filtering.  
WUAFOSR2313A5, PE61102F.

(U) Cope Rearrangement of 3,3-Dicyanohexa-1,5-diene.

JAN 89

PERSONAL AUTHORS: Devar, Michael J.; Jie, Coaxian

CONTRACT NO. AFOSR-89-0179

PROJECT NO. 2303

TASK NO. B2

MONITOR: AFOSR  
TR-89-1026

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Jnl. of Society of Chemical Communications n2 p98-100 Jan 89. Original contains color plates: All DTIC/NTIS reproductions will be in black and white.

ABSTRACT: (U) AM1 Calculations indicate that the Cope rearrangement of 3,3-dicyanohexa-1,5diene takes place by a synchronous pericyclic mechanism involving an aromatic transition state rather than by the biradicaloid path usual in chair Cope rearrangements. Reprints. (AW)

DESCRIPTORS: (U) \*AROMATIC COMPOUNDS, \*DIENES,  
\*MOLECULAR STRUCTURE, REPRINTS, TRANSITIONS, CYCLIC  
COMPOUNDS.

IDENTIFIERS: (U) WUAFOSR2303B2, PE61102F, Diene/3-3  
Dicyanohexa-1-5, Rearrangement, AM1 Calculations.

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AD-A210 995 CONTINUED

SRI INTERNATIONAL MENLO PARK CA

DESCRIPTORS: (U) \*BIOPHYSICS, \*BIONICS, \*VISION, COMPUTATIONS, CONFORMAL STRUCTURES, CONVOLUTION, FILTERS, FOVEA, FRAMES, IMAGE PROCESSING, MATHEMATICAL MODELS, MODELS, OUTPUT, RETINA, SPATIAL DISTRIBUTION, STABILITY

(U) Role of Retinocortical Processing in Spatial Vision.

DESCRIPTIVE NOTE: Annual rept. no. 2. 1 May 88-1 May 89.

JUN 89

IDENTIFIERS: (U) Retinocortical processing, Gabor filtering, PE61102F, WUAFOSR2313A5, LPN-SRI-3358.

PERSONAL AUTHORS: Kelly, Donald H.

CONTRACT NO. F49.20-87-K-0009

PROJECT NO. 2313

TASK NO. A5

MONITOR: AFOSR  
TR-89-1027

UNCLASSIFIED REPORT

ABSTRACT: (U) The inhomogeneous retinal filtering algorithms is incorporated into a more general model that includes conformal projection of the retinal filtered outputs into cortical input images, suitable for further processing, such as Gabor filtering. Our new cortical images seem to show much less loss of information relative to the retina. We no longer restore some of the dc (zero-frequency) component that is filtered out by the (Laplacian/Gaussian) retinal receptive-field model. We also provide both right- and left-hemisphere images, joined at the fovea for easy comparison with the corresponding retinal image. Study of these cortical images is yielding new insights. Peripheral objects, while remaining otherwise relatively undistorted, will be rotated either clockwise or counterclockwise as far as + or - 90 deg in cortical coordinates if they lie above or below the horizontal meridian. This is consistent with other cortical image models, but it does not bode well for the possibility of creating a stable frame by any known array-processing operation on cortical outputs. We are now beginning the third major phase of this project: modeling cortical filtering, as by Gabor functions. It is already clear that a simple, linear convolution without further refinements is not a good model for this process. Keywords: Spatial vision; Retinocortical projection; Computational model. (JHD)

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NEW YORK UNIV N Y DEPT OF PSYCHOLOGY

BROWN UNIV PROVIDENCE RI LEFSCHETZ CENTER FOR DYNAMICAL SYSTEMS

(U) Visual Motion Perception.

(U) Wavefront Propagation for Reaction-Diffusion Systems of PDE.

DESCRIPTIVE NOTE: Interim rept. 1 Feb 88-31 Jan 89.

JAN 89

MAR 89

PERSONAL AUTHORS: Sperling, George

PERSONAL AUTHORS: Barles, G.; Evans, L. C.; Souganidis, P. E.

CONTRACT NO. AFOSR-88-0140

REPORT NO. LCDS-89-3

PROJECT NO. 2313

CONTRACT NO. AFOSR-ISSA-860078

TASK NO. A5

PROJECT NO. 2304

MONITOR: AFOSR

TASK NO. A1

TR-89-1021

UNCLASSIFIED REPORT

MONITOR: AFOSR

TR-89-0574

ABSTRACT: (U) (1) Explorations of two separate motion-computation systems and the derivation of the functional properties of each. Demonstrated: A dynamic stimulus that caused the first- and second-order motion perception systems to perceive motion in opposite directions, depending on viewing distance. Discovered: Motion/texture interactions-stimuli that are accessible to only to second order motion analysis and then only after their texture has first been extracted. (2) Demonstrated: Perceiving 3D structure from 2D visual inputs depends primarily on the first-order motion perception system. (3) New spatial interaction: A textured area surround by a similar high-contrast texture appears to be of lower contrast when surrounded by neutral gray. This remarkable phenomenon contradicts all current theories of lightness perception. Investigation continuing. (SDW)

DESCRIPTORS: (U) \*MOTION, \*VISUAL PERCEPTION, CONTRAST, DYNAMICS, FUNCTIONAL ANALYSIS, GRAY(COLOR), INTERACTIONS, NEUTRAL, PERCEPTION, RANGE(DISTANCE), SPATIAL DISTRIBUTION, STIMULI, TEXTURE, THEORY, VIEWERS.

IDENTIFIERS: (U) PEG1102F.

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ABSTRACT: (U) The theory of viscosity solutions for Hamilton-Jacobi equations is used to study the asymptotic behavior of solutions to certain systems of reaction-diffusion PDE. Our principal result characterizes the region of convergence of the solution to an unstable rest point as the set where the solution of an appropriate Hamilton-Jacobi equation is positive. Keywords include: Partial differential equations; Wavefront propagation. (Jhd/rh)

DESCRIPTORS: (U) \*PARTIAL DIFFERENTIAL EQUATIONS, \*DIFFUSION, \*WAVEFRONTS, ASYMPTOTIC SERIES, SOLUTIONS(GENERAL), VISCOSITY, WAVE PROPAGATION.

IDENTIFIERS: (U) Hamilton Jacobi Equation, PEG1102F, WUAFOSR2304A1.

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CORNELL UNIV ITHACA NY LAB OF ATOMIC AND SOLID STATE PHYSICS

interactions, Energy spectra. Reprints. (edc)

(U) Trajectory Analysis of Low-Energy and Hyperthermal Ions Scattered from Cu(110).

DESCRIPTORS: (U) \*SPECTROSCOPY, \*ION BEAMS, ATOMS, ENERGETIC PROPERTIES, ENERGY, EXPERIMENTAL DATA, FOCUSING, HIGH TEMPERATURE, IMPACT, INTERACTIONS, IONS, LAYERS, LOW ENERGY, PARAMETERS, PLOTTING, REPRINTS, SCATTERING, SIMULATION, SPECTRA, SURFACES, SURFACE PROPERTIES, PARTICLE TRAJECTORIES, PARTICLE SPECTRA.

MAY 89

PERSONAL AUTHORS: McEachern, R. L.; Goodstein, D. M.; Cooper, B. H.

IDENTIFIERS: (U) SAFARI Computer program, Ion surface interactions, PE61102F, WUAFOSR2303A2.

CONTRACT NO. AFOSR-88-0069

PROJECT NO. 2303

TASK NO. A2

MONITOR: AFOSR  
TR-09-1000

## UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Physical Review B, v39 n15  
p503-510, 15 May 89.

ABSTRACT: (U) We investigated the trajectories of Na<sup>+</sup> ions scattered from the Cu(110) surface in the <1 1bar 0> and <001> azimuths for a range of incident energies from 56 eV to 4 KeV. Our goal is to explain the trends observed in the energy spectra and determine what types of trajectories contribute to these spectra. Using the computer program SAFARI, we have performed simulations with trajectory analyses for 100-, 200-, and 400-eV scattering. We show results from the 100-eV simulations in both azimuths and compare them with the experimental data. The simulated energy spectra are in excellent agreement with the data. Ion trajectories and impact parameter plots from the simulations are used to determine the relative importance of different types of ion-surface-atom collisions. The simulations have shown that the striking differences observed in comparing the <1 1bar 0> and <001> spectra are mostly due to ions which scatter from second-layer atoms. This system exhibits strong focusing onto the second-layer atoms by the first-layer rows, and the focusing is very sensitive to the spacing between the rows. At the lower beam energies, scattering from the second layer dominates the measured spectra. Keywords: Energetic ion beams, Ion-surface

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NEW YORK UNIV N Y

AD-A21Q 851 CONTINUED

(U) Cognitive and Neural Bases of Skilled Performance.

sources for the cardinal directions in color space. In a study of visual spatial attention we found enhanced responses to stimuli located at positions on which attention was focused. Keywords: Electroencephalography, Neuromagnetism. (SDW)

DESCRIPTIVE NOTE: Annual technical rept. 1 Oct 87-30 Sep 88.

MAY 89

DESCRIPTORS: (U) \*COGNITION, \*SKILLS, \*PSYCHOPHYSIOLOGY, ATTENTION, BANDWIDTH, BRAIN, COLORS, CONFIGURATIONS, ELECTROENCEPHALOGRAPHY, HEMISPHERES, MODULATION, OPTICAL IMAGES, RESPONSE, SOURCES, SPATIAL DISTRIBUTION, STIMULI, PERFORMANCE(HUMAN).

PERSONAL AUTHORS: Kaufman, Lloyd

CONTRACT NO. F49820-88-C-0131

PROJECT NO. 3484

IDENTIFIERS: (U) PEG1103D, WUAFOSR3484A4, Neuromagnetism, P300, Evoked potentials.

TASK NO. A4

MONITOR: AFOSR  
TR-89-0929

UNCLASSIFIED REPORT

ABSTRACT: (U) The results obtained using an odd-ball paradigm were inconclusive, but a new procedure was developed which uses all trials rather than trials on which only infrequent events lead to P300 responses. It is tentatively concluded that different source configurations underly P300s associated with different modalities, and possibly also different tasks within a modality. In the previous report we described a new method for analyzing spontaneous brain activity in the alpha bandwidth. We extended this method to other bandwidths and conducted some of the first studies of the modulation of spontaneous brain activity, independent of the evoked response, during the performance of high-level cognitive tasks. Research based on this methodology is now being conducted under the aegis of a separate grant. In the course of this report period we conducted a study using the 14-channel neuromagnetometer at Bellevue Hospital. The left hemisphere tends to display a monotonic increase in N100 amplitude with ISIs up to 16 sec, while the right hemisphere is not differently affected by ISIs in excess of 4 sec. In a collaborative effort with the Los Alamos National Laboratory we found that different components of auditory evoked responses originate at different locations in the two hemispheres. Also, in a study of visual responses to equiluminance color stimuli we found the first evidence for separate

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SEARCH CONTROL NO. EVI09K

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DELAWARE UNIV NEWARK DEPT OF MATHEMATICAL SCIENCES

BRISTOL UNIV (ENGLAND) DEPT OF INORGANIC CHEMISTRY

(U) The Inverse Scattering Problem for Time-Harmonic Acoustic Waves in an Inhomogeneous Medium: Numerical Experiments.

(U) Chemistry of Polynuclear Metal Complexes with Bridging Carbene or Carbyne Ligands. Part 85. Synthesis of Chain and Ring Compounds Containing Molybdenum.

DESCRIPTIVE NOTE: Rept. for 22 Apr-1 May 88.

89

89

PERSONAL AUTHORS: Colton, D. L.; Monk, P. B.

PERSONAL AUTHORS: Davies, Simon J.; Stone, F. G.

CONTRACT NO. AFOSR-86-0087

CONTRACT NO. AFOSR-86-0125

PROJECT NO. 2304

PROJECT NO. 2303

TASK NO. A9

TASK NO. B2

MONITOR: AFOSR

MONITOR: AFOSR

TR-89-0807

TR-89-0792

UNCLASSIFIED REPORT

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in IMA Jnl. of Applied Mathematics v42 p77-95 1989.

SUPPLEMENTARY NOTE: Pub. in Jnl. of the Chemical Society, Dalton Transactions, p785-795 1989. See also Part 86. AD-A210 340.

ABSTRACT: (U) In this paper, the authors describes a novel algorithm for solving the inverse scattering problem of reconstructing the shape of acoustic waves in an inhomogeneous medium from far-field data. Limited testing has shown that the algorithm has some capacity for reconstructing simple shapes using data over a limited range of frequencies. Reprints. (JHD)

ABSTRACT: (U) We have recently developed rational procedures for preparing heteropolynuclear metal complexes with structures based on chains of metal atoms, and in which the metal-metal bonds are bridged by alkylidyne groups. In the majority of these species Tungsten-Platinum or Tungsten-Nickel bonds form the spine of the molecules, and compounds with up to seven metal atoms in the chain have been characterised. A few complexes in which Mo replaces W in the chains have also been described. In attempts to extend the length of the chains beyond seven metal atoms cyclisation reactions were observed, affording metallacycles which we have termed star clusters. In this paper we report several other compounds in which Molybdenum atoms are present in the spines of the molecules, thus placing the initial observation on a firmer basis. We have also established that 'star clusters' can be prepared having Mo atoms in the metallacycle. Moreover, an interesting form of isomerism occurs which is related to different metal atom sequences within the metal cluster framework. In a subsequent paper we shall show that the presence of molybdenum atoms in these systems allows the synthesis of compounds having structures with chains of more than

DESCRIPTORS: (U) \*ACOUSTIC SCATTERING, \*INVERSE SCATTERING, ACOUSTIC WAVES, ALGORITHMS, FAR FIELD, HARMONICS, NUMERICAL METHODS AND PROCEDURES, REPRINTS, SHAPE, TEST AND EVALUATION, TIME.

IDENTIFIERS: (U) PE61102F, WUAFOSR2304A9.

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seven metal atoms. Reprints. (AW)

AUBURN UNIV AL

DESCRIPTORS: (U) \*CARBENES, \*LIGANDS, \*METAL COMPLEXES, \*MOLYBDENUM COMPOUNDS, \*SYNTHESIS(CHEMISTRY), ATOMS, CHEMICAL BONDS, CHAINS, CHEMISTRY, CLUSTERING, CYCLIC COMPOUNDS, LENGTH, METAL METAL BONDS, METALS, MOLECULES, NICKEL ALLOYS, REPRINTS, RINGS, SEQUENCES, STARS, TUNGSTEN ALLOYS, ALKYL RADICALS.

(U) Stimulus-Response Compatibility in Spatial Precuing and Symbolic Identification: Effects of Coding Practice, Retention and Transfer.

DESCRIPTIVE NOTE: Final rept. 1 Oct 87-31 Mar 89.

MAY 89

IDENTIFIERS: (U) PE62202F, WUAFOSR2303B2, Alkylidyne Groups, \*Carbynes, Bridges(Chemical Bonds).

PERSONAL AUTHORS: Practor, Robert W.; Reeve, T. G.

CONTRACT NO. AFOSR-84-0002

PROJECT NO. 2313

TASK NO. A4

MONITOR: AFOSR  
TR-89-0810

UNCLASSIFIED REPORT

ABSTRACT: (U) Research on stimulus-response compatibility effects is reviewed, with an integrated theoretical perspective provided that stresses mental coding of the stimulus and response sets. Eleven experiments, plus two follow-up experiments, are described in detail. The first six evaluate the nature of the codings used in spatial-precuing tasks. The remaining seven experiments examine the influence of practice on performance in the spatial-precuing tasks, as well as in symbolic-compatibility tasks. The experiments show that the codings used by subjects are affected by manipulations of the stimulus set but not of the response set. Compatibility effects within both tasks are reduced greatly by three sessions of practice. Transfer of these benefits to related tasks occurs in situations for which the response set is not altered. However, after more extended practice, partial transfer occurs even when the response set is changed. The results are interpreted in terms of an account that emphasizes salient-feature codings in a declarative stage of skill acquisition, with task-specific procedures acquired from practice. (KR)

DESCRIPTORS: (U) \*STIMULATION(GENERAL), \*CODING, ACQUISITION, COMPATIBILITY, IDENTIFICATION, MENTAL ABILITY, RESPONSE, SKILLS, STIMULI, STRESSES, SYMBOLS.

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TRANSFER.

JOHNS HOPKINS UNIV BALTIMORE MD DEPT OF CHEMISTRY

IDENTIFIERS: (U) PEG1102F, WUAFOSR2313A4.

(U) Observation of  $\text{NH}(a1 \text{ Delta}, v=1)$  from the  $\text{H} + \text{N}_3$  Reaction.

JUN 89

PERSONAL AUTHORS: Chen, Jing; Quinones, Edwin; Dagdigian, Paul J.

CONTRACT NO. F49620-88-C-0056

PROJECT NO. 2303

TASK NO. B1

MONITOR: AFOSR  
TR-89-1007

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Jnl. of Chemical Physics, v90  
n12 p7603-7604, 15 Jun 89.

ABSTRACT: (U) Because of the current interest in the photodissociation dynamics of molecules such as hydrazoic acid and ammonia the spectroscopy and kinetics of the  $\text{NH}$  radical have received special attention in recent years. The photolysis of these molecules involves several potential energy surfaces, and it has been established that spin-forbidden pathways are important in their decomposition in some cases. However, to the best of our knowledge, no examples of full collision processes leading to the formation of the  $\text{NH}$  radical have been studied in detail. The observation and preliminary characterization, in a molecular beam scattering experiment, of the  $\text{NH}(a1 \text{ delta})$  product from the reaction of hydrogen atoms with the azide radical,  $\text{HN}_3$  + ( $\text{X}2 \text{ pi g}$ )  $\text{NH} + \text{N}_2(\text{x}1 \text{ sigma g}^+)$ , is reported. Three electronic states of  $\text{NH}$  are energetically accessible ( $\text{X}3 \text{ sigma}^-$ ),  $a1 \text{ Delta}$ ,  $b1 \text{ sigma}^+(\text{+})$ ) in this reaction. The  $\text{N}_3$  radical was generated by reacting hydrazoic acid with fluorine atoms in a discharge-flow prereactor. A beam of hydrogen atoms was generated by a microwave discharge source using an extended Evenson-Broida cavity in a differentially pumped chamber. The  $\text{NH}(a1 \text{ Delta})$  product was detected in its  $v=1$  level by laser fluorescence excitation. The nascent  $\text{NH}(a1 \text{ Delta}, v=1)$  rotational

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distribution was parameterized by a Boltzmann form, and the distribution was fit to a 'temperature' of 750 + or - 100 K. Reprints. (AW)

DESCRIPTORS: (U) \*AMMONIA, \*HYDRAZOIC ACID, \*PHOTODISSOCIATION, \*CHEMICAL RADICALS, \*REACTION KINETICS, ATOMS, AZIDES, BEAMS(RADIATION), CHAMBERS, COLLISIONS, DECOMPOSITION, DISTRIBUTION, DYNAMICS, ELECTRONIC STATES, EXCITATION, FLUORINE, HYDROGEN, LASER INDUCED FLUORESCENCE, MICROWAVES, MOLECULAR BEAMS, MOLECULES, PHOTOLYSIS, POTENTIAL ENERGY, PUMPING, REPRINTS, ROTATION, SCATTERING, SOURCES, SPECTROSCOPY, SURFACES, NITROGEN.

IDENTIFIERS: (U) Potential Energy Surfaces, Spin Forbidden Pathways.

COLUMBIA UNIV NEW YORK DEPT OF CHEMISTRY

(U) Large Magnetic Field Effect on the Decay Rates of Triplet Hydrocarbon Diradicals.

DESCRIPTIVE NOTE: Scientific rept. for 1986-1988.

89

PERSONAL AUTHORS: Wang, Jinfeng; Doubleday, Charles, Jr.; Turro, Nicholas J.

PROJECT NO. 2303

TASK NO. 82

MONITOR: AFOSR  
TR-89-1001

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Jnl. of Physical Chemistry, v93 p4780-4782 1989.

ABSTRACT: (U) Intersystem crossing rate constants, kISC, of triplet 1, n-diphenyl 1, n-diy) diradicals (n=number of carbons in diradical chain) generated by type I photolyses of alpha-diphenylcycloalkanones were measured in an external magnetic field H variable up to 2 kG. No magnetic field effect was observed for n=4 and 5, but for n=9, 11, and 14, kISC first increased then decreased as H was increased. For n=11 and 14, the value of kISC decreased to an apparent asymptotic value at high field equal to 0.17 and 0.07, respectively, of the value of kISC at H = 0. For diradicals it is proposed that, at H = 0 electron-nuclear hyperfine coupling is the only important ISC mechanism, that at H=2kG electronic spin lattice relaxation is the major ISC mechanism, that the three triplet magnetic sublevels do not equilibrate during the diradical lifetime, and that one of the outer two triplet magnetic sublevels is preferentially populated initially. Magnetic field effect; Diradicals; Hyperfine coupling; Intersystem crossing; Hydrocarbons; Reprints. (jes)

DESCRIPTORS: (U) \*HYDROCARBONS, CONSTANTS, CROSSINGS, DECAY, EXTERNAL, MAGNETIC FIELDS, RATES, REPRINTS.

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IDENTIFIERS: (U) PE61102F, WUAFOSR230382.

VANDERBILT UNIV NASHVILLE TN DEPT OF CHEMISTRY

(U) Ab Initio Studies of Molecular Structures and Energetics. 3. Pentacoordinated  $NF_nH(5-n)$  Compounds.

89

PERSONAL AUTHORS: Weig, Carl S.; Van Wazer, John R.

CONTRACT NO. AFOSR-86-0146

PROJECT NO. 2303

TASK NO. B3

MONITOR: AFOSR  
TR-89-1006

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: See also report 2, AD-A179 601. Pub. in Jnl. of the American Chemical Society, v111 p4172-4178 1989.

ABSTRACT: (U) An ab initio quantum-chemical study has been made of the possible existence in terms of structural and thermodynamic stabilities of the pentacoordinated nitrogen hydrides and fluorides,  $NF(n)H(5-n)$  for  $n=0$  to 5. Three structurally stable species have been identified corresponding to  $n=3$  to 5. We report computed energies, vibrational frequencies, structural parameters, and multicenter analyses of total energies. For all except the last of these properties we employed the second-order perturbation approximation to the correlation energy. Nitrogen pentafluoride was studied in especial detail, including the enthalpies and free energies of two likely formation and decomposition reactions. Our analysis shows that each of these compounds contains a truly pentacoordinated first row element, with five independent linkages to the central nitrogen atom. Reprints. (AW)

DESCRIPTORS: (U) \*ENERGETIC PROPERTIES, \*HYDRIDES, \*NITROGEN COMPOUNDS, \*PENTAFLUORIDES, \*QUANTUM CHEMISTRY, ATOMS, CORRELATION, DECOMPOSITION, ENERGY, FLUORIDES, FREQUENCY, LINKAGES, MOLECULAR STRUCTURE, PARAMETERS, REPORTS, REPRINTS, STABILITY, THERMODYNAMICS, MOLECULAR VIBRATION, VIBRATIONAL SPECTRA, PERTURBATION THEORY.

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APPROXIMATION(MATHEMATICS).

PENNSYLVANIA UNIV PHILADELPHIA DEPT OF CHEMISTRY

IDENTIFIERS: (U) PE61102F, WJAFOSR2303B3, \*Nitrogen Pentahydride, \*Nitrogen Pentafluoride, Nitrogen Hydrides, Nitrogen Fluorides, Ab Initio Calculations.

(U) Liquid, Crystalline Phosphazenes. High Polymeric and Cyclic Trimeric Systems with Aromatic Azo Side Groups.

JUN 89

PERSONAL AUTHORS: Allock, Harry R.; Kim, Chulhee

CONTRACT NO. JAFOSR-84-0174

PROJECT NO. 2303

TASK NO. 82

MONITOR: AFOSR  
TR-89-1008

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Macromolecules, v22 p2196-2606 1989.

ABSTRACT: (U) Liquid crystalline polymers are an important subject for fundamental and technological studies because of their unusual anisotropic optical, electrical, and mechanical properties. Liquid crystalline polymers fall into two general categories: 1) species with rigid mesogenic groups incorporated into the backbone structure (main-chain liquid crystalline polymers); 2) polymers with mesogenic units in the side-group structure. This present work deals with polymers of the second type. Side-chain liquid crystallinity generally requires a molecular structure in which a flexible polymer chain, or flexible connector group between the mesogen and backbone, provides sufficient conformational freedom to allow the rigid mesogenic units to form stacks or organized domains. Liquid crystallinity has been detected when mesogenic side groups are linked to highly flexible when the carrier macromolecule is less flexible chain such as a polymethacrylate or polyacrylate system, provided the spacer group is sufficiently long and flexible. Reprints. (JES)

DESCRIPTORS: (U) \*LIQUID CRYSTALS, \*PHOSPHAZENE, \*POLYMERS, CHAINS, CONNECTORS, CRYSTALS, DIAZO COMPOUNDS, LIQUIDS, MACROMOLECULES, MECHANICAL PROPERTIES, MOLECULAR STRUCTURE, POLYACRYLATES, REPRINTS, SIDES, CHEMICAL

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RADICALS, AROMATIC COMPOUNDS, METHACRYLATES.

NEW YORK ACADEMY OF SCIENCES NY

IDENTIFIERS: (U) PE81102F, WUAFOSR2303B2, Trillers, Azo  
Groups, Side Groups, Mesogenic Groups.

(U) Proceedings of the International Conference (3rd) on  
Combinatorial Mathematics Held in New York on 10-14  
June 1985. (Annals of the New York Academy of Sciences,  
Volume 555).

MAY 89 446P

PERSONAL AUTHORS: Bloom, Gary S.; Graham, Ronald L.;  
Malkevitch, Joseph

CONTRACT NO. AFOSR-85-0104

PROJECT NO. 2304

TASK NO. A3

MONITOR: AFOSR  
TR-87-1730

UNCLASSIFIED REPORT

Availability: The New York Academy of Sciences, 2 East  
63rd St., New York, NY 10021. PC \$109.00. (No copies  
furnished by DTIC/NRIS).

ABSTRACT: (U) This volume collects the papers and  
problems from the Third International Conference on  
Combinatorial Mathematics held at the Barbizon Plaza  
Hotel in New York City under the auspices of the New York  
Academy of Sciences from June 10 through June 14, 1985.  
These papers explore aspects of such topics as structural  
graph theory, extremal set theory, Ramsey theory,  
combinatorial group theory, random graphs, matroids,  
finite geometries, game theory block designs, coding  
theory, polyhedral combinatorics, irregularities of  
distribution, and combinatorial number theory, to name a  
few, as well as a healthy dose of the increasingly  
important algorithmic aspects of these various subjects  
Keywords: Hypergraphs; Trees; Theorems. (KR)

DESCRIPTORS: (U) COMBINATORIAL ANALYSIS, CODING, GAME  
THEORY, GRAPHS, GROUPS(MATHEMATICS), INTERNATIONAL,  
MATHEMATICS, NEW YORK(NEW YORK), NUMBER THEORY,  
STRUCTURAL PROPERTIES, SYMPOSIA, THEORY, TREES.

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STATE UNIV OF NEW YORK AT BUFFALO AMHERST

(U) Effect of Body Forces on Motion and Heat Transfer of Confined Fluids.

(U) Recent Progress in the Theory of Laser-Assisted Collisions.

DESCRIPTIVE NOTE: Final scientific rept. 1 Nov 76-31 Oct 78.

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PERSONAL AUTHORS: Arnoldus, Henk F.; George, Thomas F.; Lam, Kai-Shue; Scipione, J. F.; DeVries, Paul L

PERSONAL AUTHORS: Ostrach, Simon

REPORT NO. TR-98

CONTRACT NO. AFOSR-77-3171

CONTRACT NO. F49620-86-C-0009

PROJECT NO. 2307

PROJECT NO. 2303

TASK NO. A4

TASK NO. B3

MONITOR: AFOSR  
TR-89-0876MONITOR: AFOSR  
TR-89-0826

## UNCLASSIFIED REPORT

## UNCLASSIFIED REPORT

ABSTRACT: (U) Despite the numerous natural and technological occurrences of transport processes due to complex driving forces little information about them is available. Under this grant we have begun to study several different coupled convection problems. Study topics include: Combined thermal and hydrodynamic instability; Effects of stabilizing temperature gradients on confined natural convection flows; Convection induced by combined horizontal temperature and concentration gradients; and Waste heat disposal into a stratified environment. (EDC)

DESCRIPTORS: (U) \*CONVECTION, \*FLUID FLOW, \*HEAT TRANSFER, CONFINEMENT(GENERAL), CONCENTRATION(COMPOSITION), CONVECTION(HEAT TRANSFER), COUPLING(INTERACTION), FLUIDS, GRADIENTS, HORIZONTAL ORIENTATION, HYDRODYNAMICS, MOTION, STABILIZATION, STRATIFICATION, TEMPERATURE, TEMPERATURE GRADIENTS, THERMAL INSTABILITY, TRANSPORT PROPERTIES, WASTE DISPOSAL.

IDENTIFIERS: (U) PE61102F, WUAFOSR2307A4

SUPPLEMENTARY NOTE: Pub. in Laser Applications in Physical Chemistry, p329-375 1989.

ABSTRACT: (U) This is a review article which addresses the following topics: (1) atomic collision processes in the presence of ultrashort laser pulses; (2) laser induced bound states; and (3) collisional spectroscopy, which includes lineshapes of a laser driven atom in a perturber gas and new applications of the electronic field representation. Keywords: Atomic collisions, ultrashort laser pulses; Laser induced bound states; Collisional spectroscopy; Lineshapes; Electronic field representation; Reprints. (JHD)

DESCRIPTORS: (U) \*PARTICLE COLLISIONS, \*ATOMIC SPECTROSCOPY, ELECTRIC FILTERS, LASER PUMPING, SPECTRAL LINES, SHAPE, PULSED LASERS, REPRINTS, SHORT PULSES

IDENTIFIERS: (U) Collisional Spectroscopy, PE61102F, WUAFOSR230383

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CARNEGIE-MELLON UNIV PITTSBURGH PA DEPT OF CHEMISTRY

(J) Studies on Aligned Nematic Solutions of a Rodlike Polymer.  
IDENTIFIERS: (U) PEG1102F, WUAFDSR2303A3, PBT(Poly(1,4-phenylene-2,6-benzobisthiazole)), \*Polyphenylene Benzobisthiazoles, \*Nematic Solutions, Thiazole/Poly(1,4-phenylene-2,6-benzobis), Rodlike Polymers.

88 5P

PERSONAL AUTHORS: Berry, Guy C.; Srinivasarao, Mohan

CONTRACT NO. AFDSR-89-0125

PROJECT NO. 2303

TASK NO. A3

MONITOR: AFDSR  
TR-89-1004

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Liquid Crystals and Biological Systems, ch9 p389-392 1988.

ABSTRACT: (U) The dynamics of rodlike chains in nematic solutions have not yet been definitely elucidated. Theoretical calculations of the constitution relation for the stress tensor rely on the notion of restricted rotational diffusion. Several variations of this model have been employed to compute the six viscosity coefficients  $\alpha_{ijkl}$  in the Leslie-Ericksen stress tensor as functions of the order parameter  $S$  of the orientation of the rods along a preferred direction. These results differ significantly including, for example, in the prediction of whether or not shear flow is stable (in the absence of external fields). Nematic solutions of poly(1,4-phenylene-2,6-benzobisthiazole), PBT, a rodlike polymer, afford an opportunity for experimental studies of the flow behavior of rodlike chains. Keywords: Monodomain; Nonlinear optics; Light scattering; Reprint. (aw)

DESCRIPTORS: (U) \*LIQUID CRYSTALS, \*THIAZOLES, \*POLYPHENYLENES, COEFFICIENTS, COMPUTATIONS, DIFFUSION, EXPERIMENTAL DATA, EXTERNAL, FLOW, LIGHT SCATTERING, LIMITATIONS, NONLINEAR SYSTEMS, OPTICS, PARAMETERS, POLYMERS, REPRINTS, RODS, ROTATION, SHEAR PROPERTIES, SOLUTIONS(MIXTURES), THEORY, VISCOSITY, MOLECULAR STRUCTURE, CRYSTAL STRUCTURE, ALIGNMENT.

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AD-A210 602 CONTINUED

CARNEGIE-MELLON UNIV PITTSBURGH PA DEPT OF CHEMISTRY  
(U) Rheological Properties of Nematic Solutions of Rodlike Polymers,

ELASTIC PROPERTIES, FLOW, ISOTROPISM, LIGHT SCATTERING, LIMITATIONS, LIQUID PHASES, MATHEMATICAL PREDICTION, METHODOLOGY, MOLECULES, NONLINEAR SYSTEMS, OPTICAL PROPERTIES, OPTICS, RANGE(EXTREMES), RATES, REPRINTS, SHEAR PROPERTIES, STEADY STATE, THEORY, VISCOSITY.

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IDENTIFIERS: (U) PEG1102F, WUAFOSR2303A3, Nematic Solutions, Nematic Phase, Rodlike Polymers, Nematogens, Monodomain, Nonlinear Optics, Rheooptical Properties.

PERSONAL AUTHORS: Berry, Guy C.

CONTRACT NO. AFOSR-89-0125

PROJECT NO. 2303

TASK NO. A3

MONITOR: AFOSR  
TR-89-1003

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Mol. Cryst. Liquid Crystals, v165 p333-360 1988.

ABSTRACT: (U) It has long been known that solutions of nematic polymers exhibit peculiar flow behavior with increasing concentration  $c$  of the polymer as  $c$  is increased beyond the value  $CNI$  required to form a nematic phase. For example, although a limiting viscosity  $\eta_{\infty}$  is found under steady-state shear at small shear rate for  $c < CNI$ , for  $c > CNI$  the apparent viscosity seems to increase without limit as the deformation rate is reduced, being essentially a constant  $\eta_{\infty}$  over a range of rates that are neither too slow nor too fast. The rheological properties of nematic solutions of rodlike polymers are discussed. Comparisons are made with the behavior of isotropic solution of rodlike polymers as well as that of small molecule nematogens. Evaluation of the Frank elastic constants and the Leslie-Ericksen viscosity coefficients by light scattering methods is discussed, along with theoretical prediction of the latter of rodlike systems. The nature of shear deformation over a wide range of shear rates is discussed in terms of possible flow instabilities revealed by rheological and rheo-optical observations. Keywords: Monodomain; Nonlinear optics; Reprints. (aw)

DESCRIPTORS: (U) LIQUID CRYSTALS, RHEOLOGY, SOLUTIONS(MIXTURES), POLYMERS, CONSTANTS, DEFORMATION.

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CARNEGIE-MELLON UNIV PITTSBURGH PA DEPT OF CHEMISTRY

(U) Properties of Solutions of Rodlike Chains from Dilute Solutions to the Nematic State.

NOV 88 15P

PERSONAL AUTHORS: Berry, Guy C.

CONTRACT NO. AFOSR-89-0125

PROJECT NO. 2303

TASK NO. A3

MONITOR: AFOSR  
TR-89-1005

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Proceedings, Materials Research Society, Nov 88

ABSTRACT: (U) Certain aspects of the physical chemistry of solutions rodlike polymers are reviewed. The range of concentrations includes infinite dilution ( $e + a$ ), dilute solutions ( $E+Ac<1$ ), moderately concentrated solutions ( $1<E+Ac<E+Ac_{crit}$ ), and concentrated solutions ( $C>C_{crit}$ ), where  $E+A$  is the intrinsic viscosity and  $C_{crit}$  is the concentration required for a stable nematic phase. Studies of chain conformation are emphasized at infinite dilution, and rheological behavior is emphasized for more concentrated isotropic and nematic solutions. Both theoretical and experimental considerations are included. The physical chemistry of solutions of rodlike chains has received renewed attention since the discovery that synthetic polymers may be designed to adopt a rodlike configuration and form nematic liquid crystalline solutions. Some of the salient features of this work will be summarized in the following, with examples from the literature on theoretical and experimental studies. The concluding section will present a discussion of some unsolved problems. We will emphasize work on rodlike chains designed to exhibit a nematic mesophase in solution and high strength and modulus in the ordered solid processed from the mesophase. Keywords: Monodomain; Nonlinear optics; Light scattering; Reprints; (aw)

DESCRIPTORS: (U) \*DILUENTS, \*LIQUID CRYSTALS, \*POLYMERS, \*SOLUTIONS(MIXTURES), CHAINS, CONFORMITY, DILUTION, EXPERIMENTAL DATA, HIGH STRENGTH, ISOTROPISM, LIGHT SCATTERING, LIQUID PHASES, NONLINEAR SYSTEMS, OPTICS, PHASE, PHYSICAL CHEMISTRY, REPRINTS, RHEOLOGY, STABILITY.

IDENTIFIERS: (U) PE61102F, WUAFOSR2303A3, \*Rodlike Polymers, Nematic Phase, Mesophase, Monodomain, Nonlinear Optics.

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NEW YORK UNIV MEDICAL CENTER NY COMPUTATIONAL  
NEUROSCIENCE LABS

IDENTIFIERS: (U) PEG1102F, WUAFOSR2313A5.

(U) Cepstral Filtering on a Columnar Image Architecture: A  
Fast Algorithm for Binocular Stereo Segmentation.

DESCRIPTIVE NOTE: Final rept. 15 Sep 85-14 Sep 88,

MAY 89 21P

PERSONAL AUTHORS: Yeshurun, Yehezkel; Schwartz, Eric L.

CONTRACT NO. AFOSR-85-0341

PROJECT NO. 2313

TASK NO. A5

MONITOR: AFOSR  
TR-89-0966

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in IEEE Transactions on Pattern  
Analysis and Machine Intelligence, 14p Jun 89.

ABSTRACT: (U) Preprints and reprints of journal articles  
comprise this report. Articles describe and implement  
novel techniques in Neurobiology, Differential Geometry,  
and Computer Vision. Some articles describe  
Neurobiological work on the use of metabolic markers to  
indicate coarse structural organization of visual cortex  
in mammals. Other articles describe algorithms for  
processing data from brain sections to obtain accurate 2D  
and 3D reconstruction of intact tissue. Another article  
presents a novel algorithm for projecting convoluted  
surfaces onto the plane (a solution to the map-makers  
problem). Other articles describe algorithms for visual  
stereo (determination of depth map) and scanning  
(redirection of optic axis) consistent with the  
neurobiology and psychophysics. Reprints. (RH).

DESCRIPTORS: (U) \*ALGORITHMS, \*COMPUTER GRAPHICS,  
\*NEUROBIOLOGY, \*PSYCHOPHYSICS, \*VISUAL CORTEX,  
ARCHITECTURE, BINOCULARS, BRAIN, DEPTH, DETERMINATION,  
DIFFERENTIAL GEOMETRY, IMAGES, MAMMALS, MAPS, MARKERS,  
METABOLISM, OPTICS, ORGANIZATIONS, PROCESSING, PRINTS,  
SEGMENTED, STRUCTURAL PROPERTIES.

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CALIFORNIA UNIV SAN DIEGO LA JOLLA DEPT OF ELECTRICAL  
ENGINEERING AND COMPUTE R SCIENCES

(U) Studies of High Power Density, Pico-Second Rise-Time  
Light Activated Semiconductor Switch.

DESCRIPTIVE NOTE: Final rept. 1 Sep 87-31 Dec 88.

DEC 88 107P

PERSONAL AUTHORS: Yu, Paul L.

CONTRACT NO. AFOSR-87-0351

PROJECT NO. 2301

TASK NO. A7

MONITOR: AFOSR  
TR-89-0993

UNCLASSIFIED REPORT

ABSTRACT: (U) The carrier dynamics of the diode which is related to its electrical power switching behaviors is investigated in this program. A model is developed where the carrier transport and Maxwell equations are incorporated and self-consistent electrical field profiles, current density and carrier are obtained in the PIN diode. Both low and high level optical excitations as well as low and high applied bias situations can be described by this model. The transient behavior of the diode switch at different optical energy levels is now well understood, while conventional theory for photodiodes at low level excitation and at low bias cannot be applied to cases for high level excitation and high bias. As a circuit element, the rise time of the switch under these circumstances depends on the time the internal field is cancelled out by mobile carriers generated. The predicted input energy dependence and the transmission line impedance dependence of the rise time compare well with experimental results. The model also suggests the experimental configuration for obtaining power in the GW range. Finally, a preliminary investigation is made on the effects of avalanche multiplication on the performance of the diode switch. (rh)

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DESCRIPTORS: (U) \*AVALANCHE EFFECT(ELECTRONICS), \*CHARGE CARRIERS, \*CURRENT DENSITY, \*ELECTRIC FIELDS, \*ELECTRIC SWITCHES, \*ELECTRICAL IMPEDANCE, \*OPTICAL PROPERTIES, \*PHOTODIODES, \*PIN DIODES, \*TRANSMISSION LINES, BEHAVIOR, BIAS, CIRCUITS, CONFIGURATIONS, CONSISTENCY, DIODES, DYNAMICS, ELECTRIC POWER, ENERGY, ENERGY LEVELS, EXCITATION, HIGH DENSITY, HIGH POWER, INPUT, INTERNAL, LOW LEVEL, MAXWELLS EQUATIONS, MULTIPLICATION, PROFILES, SWITCHES, THEORY, TRANSIENTS, TRANSPORT PROPERTIES.

IDENTIFIERS: (U) WUAFOSR2301A7, PEG1102F.

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STATE UNIV OF NEW YORK AT BUFFALO DEPT OF CHEMISTRY

(U) Picosecond Laser-Induced Transient Grating Probe of the Mechanical Properties of High-Modulus Poly(p-phenylenebenzobisoxazole-2,6-diyl),

89 6P

IDENTIFIERS: (U) PE61102F, WUAFOSR2303A3, Laser Induced Transient Grating Technique, Rigid Rod Polymers, Polybenzobisoxazole, Polyphenylenebenzobisoxazoles, Poly(p-Phenylenebenzobisoxazole-2-6-Diyl), Christoffel Equation.

PERSONAL AUTHORS: Rao, D. N.; Pang, Yang; Burzynski, Ryszard; Prasad, Paras N.

CONTRACT NO. F49620-87-C-0042

PROJECT NO. 2303

TASK NO. A3

MONITOR: AFOSR TR-89-0823

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Macromolecules, v22 n2 p985-989 1989.

ABSTRACT: (U) The picosecond laser-induced transient grafting technique was used to determine the elastic constants of a predominantly uniaxial film of a rigid-rod polymer, poly(benzobisoxazole). By adjusting the grating angle, ultrasonic phonons in the frequency range 0.4-2 GHz were generated and their in-plane speed in various directions was measured. The speed was found to be independent of the phonon frequency in the range of frequency studied. The general Christoffel equation was used to fit the observed anisotropy of the acoustic velocity. This fit conveniently yielded various elastic moduli demonstrating the application of picosecond laser-induced transient grating methods for obtaining both longitudinal and shear components of elastic constants for an anisotropic medium. Reprints. (aw)

DESCRIPTORS: (U) \*GRATINGS(SPECTRA), \*MODULUS OF ELASTICITY, \*POLYMERIC FILMS, \*POLYPHENYLENES, \*BENZOXAZOLES, ACOUSTIC VELOCITY, ANGLES, ANISOTROPY, AXES, CONSTANTS, ELASTIC PROPERTIES, EQUATIONS, FILMS, FREQUENCY, FREQUENCY BANDS, LASERS, MECHANICAL PROPERTIES, METHODOLOGY, PHONONS, PROBES, REPRINTS, SHEAR PROPERTIES, TRANSIENTS, ULTRASONICS.

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CINCINNATI UNIV OHIO DEPT OF MICROBIOLOGY

AD-A210 509 6/7 7/4 6/1

(U) Surface Electrochemistry of Amino Acids: Voltammetry Assisted by EELS (Electron Energy-Loss Spectra), Auger and LEED.

88 10P

PERSONAL AUTHORS: Hubbard, Arthur T.; Frank, Douglas G.; Tarlov, Michael J.; Batina, Nicholas; Walton, Nicholas

CONTRACT NO. AFOSR-86-0200

PROJECT NO. 2303

TASK NO. A1

MONITOR: AFOSR  
TR-89-0998

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Redox Chemistry and Interfacial Behavior of Biological Molecules, p229-245 1988.

ABSTRACT: (U) Recent studies by means of thin-layer electrochemistry of the chemisorption at polycrystalline Pt of hydroquinone, catechol and more than 50 related compounds have revealed that a layer of oriented molecules is formed in virtually all instances. Variables affecting adsorbate orientation include: adsorbate molecular structure, adsorbate concentration, electrode potential, nature of the electrolyte anion, temperature, solvent and structure of the Pt surface. Adsorbate orientation strongly influences the course of electrocatalytic oxidation and reduction. The present work brings some advances in technique to bear on such studies: well-defined Pt(111) and Pt(100) surface were employed as substrates; surface molecular packing densities were measured by means of Auger spectroscopy (rather than by thin-layer voltammetry), thus extending the range of experimentation to include non-electroactive compounds and concentrations outside the range of adsorption measurements with thin-layer electrodes; much useful insight into the nature of the adsorbed species was obtained from electron energy-loss spectra (EELS) of the adsorbed layers. Reprints. (KT)

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DESCRIPTORS: (U) \*AMINO ACIDS, \*ELECTROCHEMISTRY, \*SURFACE REACTIONS, ADSORPTION, ANIONS, AUGER ELECTRON SPECTROSCOPY, AUGERS, CHEMISORPTION, ELECTRODES, ELECTROLYTES, ELECTRON ENERGY, ELECTRON SPECTROSCOPY, LAYERS, LOSSES, MEASUREMENT, MOLECULES, PACKING DENSITY, PHENOLS, REPRINTS, SUBSTRATES, SURFACES, THIN FILMS, VOLTAMMETRY.

IDENTIFIERS: (U) PE61102F, WUAFOSR2303A1, EELS(Electron Energy Loss Spectra).

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CHICAGO UNIV IL SPEECH RESEARCH LAB

(U) Attention and Vigilance in Speech Perception.

DESCRIPTIVE NOTE: Final rept. 1 Jul 87-31 Dec 88,

JUN 89 72P

PERSONAL AUTHORS: Nusbaum, Howard C.

CONTRACT NO. AFOSR-97-0272

PROJECT NO. 2313

TASK NO. A4

MONITOR: AFOSR  
TR-89-0963

UNCLASSIFIED REPORT

ABSTRACT: (U) This report describes research carried out in three related projects investigating the function and limitations of attention in speech perception. The projects were directed at investigating the distribution of attention in time during phoneme recognition, perceptual normalization of talker differences, and perceptual learning of synthetic speech. The first project demonstrates that in recognizing phonemes listeners attend to earlier and later phonetic context, even when that context is in another syllable. The second project demonstrated that there are two mechanisms underlying the ability of listeners to recognize speech across talkers. The first, structural estimation, is based on computing a talker-independent representation of each utterance on its own; the second, contextual tuning, is based on learning the vocal characteristics of the talker. Structural estimation requires more attention and effort than contextual tuning. The final project examined the attentional demands of synthetic speech and how they change with perceptual learning. The results demonstrated that the locus of attentional demands in perception of synthetic speech is in recognition rather than storage or recall of synthetic speech. Moreover, perceptual learning increases the efficiency with which listeners can use spare capacity in recognizing synthetic speech and this effect is not just due to increased intelligibility. Our results suggest that perceptual learning allows listeners

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to focus on the relevant acoustic-phonetic properties of a particular, synthetic talker. (sdw)

DESCRIPTORS: (U) \*ATTENTION, \*PERCEPTION(PSYCHOLOGY), \*SPEECH RECOGNITION, \*VIGILANCE, AUDITORY PERCEPTION, CAPACITY(QUANTITY), DISTRIBUTION, ESTIMATES, HUMANS, INTELLIGIBILITY, LEARNING, LIMITATIONS, LOCUS, NORMALIZING(STATISTICS), PHONEMES, PHONETICS, RECALL, SPARE PARTS, SPEECH, STORAGE, STRUCTURAL PROPERTIES, SYNTHESIS.

IDENTIFIERS: (U) PEG1102F, WUAFOSR2313A4.

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CASE WESTERN RESERVE UNIV CLEVELAND OH DEPT OF PSYCHOLOGY

OHIO STATE UNIV COLUMBUS DEPT OF PHYSICS

(U) Models of Mental Functioning.

(U) International Symposium (43rd) on Molecular Spectroscopy Held in Ohio State University on 13-17 June 1988.

DESCRIPTIVE NOTE: Final rept. 15 Jun 87-14 Dec 88.

MAY 89 15P

DESCRIPTIVE NOTE: Final rept..

PERSONAL AUTHORS: Netterman, Douglas K.

JUN 88 213P

CONTRACT NO. AFOSR-87-0227

PERSONAL AUTHORS: Rao, K. N.

PROJECT NO. 2313

CONTRACT NO. AFOSR-86-0065

TASK NO. A7

PROJECT NO. 2310

MONITOR: AFOSR  
TR-89-0813

TASK NO. A1

MONITOR: AFOSR  
TR-89-1009

## UNCLASSIFIED REPORT

ABSTRACT: (U) The purpose of this research was to develop models of basic cognitive tasks developed in previous research. A model of choice reaction time was written in SImscript II.5 but development of this model made it clear that additional information was required before good models of basic cognitive tasks could be devised. Therefore, a number of experiments were conducted which were designed to provide the basic information needed. The experiments focused on several questions important to the construction of explicit models. Some of these questions were: How do subjects build mental models of instructions and to what extent do the goodness of these models affect subsequent performance? What aspects of stimulus structure are important in the encoding of the stimuli used in these tasks? Seven experiments addressing these issues were conducted. In general, results suggest that basic cognitive tasks are far more complex than had previously been thought. Keywords: Individual differences, Mental models, Cognition. (SDW)

DESCRIPTORS: (U) \*COGNITION, \*MENTAL ABILITY, ADDRESSING, CODING, INFORMATION SYSTEMS, INSTRUCTIONS, MODELS, REACTION TIME, STIMULI.

IDENTIFIERS: (U) WUAFOSR2313A7, PE61102F, Individual differences.

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## UNCLASSIFIED REPORT

ABSTRACT: (U) The 43rd Symposium on Molecular Spectroscopy was convened at Ohio State University during the period 13-17 June 1988. Over 300 scientists attended, representing research organizations from the US and fourteen foreign countries. Topical areas included electronic characteristics of molecules, energy transfer, infrared and microwave spectra, molecular beams, vibrational analysis, and experimental techniques. (aw)

DESCRIPTORS: (U) \*ELECTRONIC STATES, \*ENERGY TRANSFER, \*MOLECULAR BEAMS, \*MOLECULAR SPECTROSCOPY, \*SYMPOsia, \*MOLECULAR VIBRATION, EXPERIMENTAL DESIGN, FOREIGN, INTERNATIONAL, METHODOLOGY, MICROWAVES, MOLECULES, NATIONALS, SCIENTIFIC ORGANIZATIONS, SPECTRA, ELECTRON TRANSITIONS, INFRARED SPECTRA.

IDENTIFIERS: (U) PE61102F, WUAFOSR2310A1.

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CERAMPHYSICS INC WESTERVILLE OH

CORNELL UNIV ITHACA NY DEPT OF CHEMISTRY

(U) Capacitive Energy Storage at Cryogenic Temperatures.  
Phase 2.(U) Methane and Benzene Activation via Transient (t-Bu<sub>3</sub>SiNH)<sub>2</sub>Zr=NSi-t-Bu<sub>3</sub>.

DESCRIPTIVE NOTE: Final rept. 1 Jan 86-31 Dec 88.

88

4P

FEB 89 148P

PERSONAL AUTHORS: Cummins, Christopher C.; Baxter, Steven M.; Wolczanski, Peter T.

PERSONAL AUTHORS: Clark, C. F.

CONTRACT NO. F49620-86-C-0029

CONTRACT NO. AFOSR-87-0103

PROJECT NO. 3005

PROJECT NO. 2303

TASK NO. A1

TASK NO. B2

MONITOR: AFOSR

MONITOR: AFOSR

TR-89-0995

TR-89-0828

UNCLASSIFIED REPORT

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ABSTRACT: (U) The primary goal of this Phase II program was to improve the dielectric breakdown strength of ceramic multilayer capacitors (MLC's) in order to improve capacitive energy storage at liquid-nitrogen temperatures. A secondary goal was to explore the reproducibility of a field-enforced state-switching effect discovered in the Phase I program. The ceramic composition involved in these programs is designated as CPN17 and has a dielectric constant in the range 8,000-10,000 at 77 K. Several variations in conventional ceramic-processing parameters were studied, leading to systematic improvements in the breakdown strength at 77 K (180 to 250 to 400 kV/cm). (RH)

DESCRIPTORS: (U) \*BREAKDOWN(ELECTRONIC THRESHOLD), \*CERAMIC CAPACITORS, \*CERAMIC MATERIALS, \*CRYOGENICS, \*DIELECTRIC PROPERTIES, \*DIELECTRIC STRENGTH, \*ENERGY STORAGE, CONSTANTS, LAYERS, LIQUID NITROGEN, LOW TEMPERATURE, REPRODUCIBILITY, TEMPERATURE.

IDENTIFIERS: (U) WUAFOSR3005A1, PEB1102F.

DESCRIPTORS: (U) \*BENZENE, \*METHANE, \*ZIRCONIUM COMPOUNDS, \*METAL COMPLEXES, \*CHEMICAL REACTIONS, ACTIVATION, ALKANES, CARBON, CHEMICAL BONDS, FREE

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SUPPLEMENTARY NOTE: Pub. in Jnl. of the American Chemical Society, v110 p8731-8733 1988.

ABSTRACT: (U) Over the past decade, the activation of carbon-hydrogen bonds by transition-metal complexes has undergone intense investigation. Alkane dehydrogenations, discrete RH oxidative additions, free-radical processes, and Sigma-bond metatheses comprise most of the reactivity investigated. Reactions of alkanes with multiply bonded functionalities are rare yet constitute an important class of transformations related to the partial oxidation or functionalization of unactivated C-H bonds. During the course of assessing the utility of t-Bu<sub>3</sub>SiNH- as an ancillary ligand related to t-Bu<sub>3</sub>SiO- (Silox), a mode of intermolecular C-H activation involving addition across a transient zirconium imide was discovered. Treatment of zirconium tetrachloride with 3 equiv of t-Bi<sub>3</sub>SiNHLi, prepared from n-BuLi and t-Bu<sub>3</sub>SiNH<sub>2</sub>, resulted in the formation of (t-Bu<sub>3</sub>SiNH)<sub>2</sub>ZrCl (1, eq 1) in 88% yield. Alkylation of 1 with appropriate Grignard reagents yielded white crystals of the methyl, phenyl, and cyclohexyl (Cy) derivatives, (t-Bu<sub>3</sub>SiNH)<sub>2</sub>ZrR (R = Me Reprints. (aw)



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RADICALS, GRIGNARD REAGENTS, HYDROGEN, IMIDES, INTENSITY, OXIDATION, REACTIVITIES, REPRINTS, TRANSFORMATIONS, TRANSIENTS, TRANSITION METAL COMPOUNDS, BUTYL RADICALS, SILICON COMPOUNDS.

IDENTIFIERS: (U) PE6110ZF, WUAFOSR2303B2, Carbon Hydrogen Bonds, Dehydrogenation, Zirconium Tetrachloride, Alkylation.

STATE UNIV OF NEW YORK AT BUFFALO DEPT OF CHEMISTRY

(U) Picosecond Degenerate Four-Wave Mixing Study of Nonlinear Optical Properties of the Poly-N-Vinyl Carbazole; 2,4,7-Trinitrofluorenone Composite Polymer Photoconductor,

MAY 89 5P

PERSONAL AUTHORS: Ghoshal, Sunil K.; Chopra, Pratibha; Singh, Bhanu P.; Swiatkiewicz, Jacek; Prasad, Paras N.

CONTRACT NO. F49620-87-C-0042

PROJECT NO. 2303

TASK NO. A3

MONITOR: AFOSR  
TR-89-0822

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Jnl. of Chemical Physics, v90 n9 p5078-5081, 1 May 89.

ABSTRACT: (U) The role of charge carriers in determining optical nonlinearities in inorganic semiconductors and photoconductors has been widely investigated. An evaluation of optical nonlinearities derived from charge carriers in organic semiconductors and photoconductors is lacking. Our initial motivation for the present work was to assess the contributions to  $\chi(3)$  derived from charge carrier dynamics in organic systems. For our study of third-order optical nonlinearity in an organic photoconductor, we have chosen poly-N-vinyl carbazole (PVK) as the photosystem which has been widely studied. Resonant third-order nonlinear optical susceptibility  $\chi(3)$  of poly-vinyl-n-carbazole; 2,4,7-trinitrofluorenone composite polymer photoconductor has been measured at 602 nm for various compositions by a picosecond degenerate four-wave mixing. The origin of effective third order nonlinearity of this system is attributed to the charge-transfer excitation which creates thermalized correlated electron-hole pairs. The optical nonlinearity of this polymeric system is characterized by a long relaxation time of hundreds of picoseconds. A progressive

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enhancement of the signal intensity and hence effective  
X(3) accompanied by an increase in the decay rate of the  
degenerate four-wave mixing signal has been observed with  
an increase in the mole fraction of trinitrofluorenone.  
Reprints. (AW)

DESCRIPTORS: (U) \*PHOTOCONDUCTORS, \*FLUOROPOLYMERS,  
CHARGE CARRIERS, DECAY, DYNAMICS, ELECTRONICS,  
HOLES(ELECTRON DEFICIENCIES), INORGANIC MATERIALS,  
INTENSITY, LONG RANGE(TIME), MOTIVATION, NONLINEAR  
SYSTEMS, OPTICAL PROPERTIES, ORGANIC MATERIALS, RATES,  
RELAXATION TIME, REPRINTS, SEMICONDUCTORS, SIGNALS, VINYL  
RADICALS, HOLES(ELECTRON DEFICIENCIES), COMPOSITE  
MATERIALS.

IDENTIFIERS: (U) PE81102F, WUAFOSR2303A3,  
\*Trinitrofluorenones, Fluorenone/2-4-7-Trinitro,  
Polyvinyl Carbazoles, Poly-N-Vinyl Carbazole, \*Nonlinear  
Optical Properties, Four Wave Mixing.

STANFORD UNIV CA DEPT OF MECHANICAL ENGINEERING

(U) Separated Flows, Turbulence Production Mechanisms and  
Free Shear Layers.

DESCRIPTIVE NOTE: Final rept. 1 Dec 73-30 Nov 78.

JAN 79 38P

PERSONAL AUTHORS: Kline, S. J.; Ferziger, J. H.

CONTRACT NO. F44620-74-C-0016

PROJECT NO. 2307

TASK NO. A4

MONITOR: AFOSR  
TR-89-0986

UNCLASSIFIED REPORT

ABSTRACT: (U) The work forms part of an integrated, long-term program in complex turbulent flows and related convection heat transfer. A very large fraction of all difficulties in complex turbulent flow fields arises from lack of the ability to predict the behavior of two phenomena: turbulence and flow separation. Ongoing research included work on the following topics: experimental studies of fundamental flow physics; development of computational models and programs at several levels of complexity; Development of design data and design procedures for some technologically critical applications; production of data and computational methods for flow over curved surfaces with blowing and suction; development of instruments and instrument procedures pertinent to these tasks. Usually, several phases of research on each topic have been progress. Applied problems of special interest to DOD include diffusers for both combustors and after-turbine sections in jet engines, flight vehicle inlets, cooling of high-temperature turbine blades, and coordination of an international effort to confront computational procedures in complex turbulent flows with carefully screened data of a wide variety. Many commercial applications also exist. (jhd)

DESCRIPTORS: (U) FLOW SEPARATION, JET ENGINE INLETS.

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\*TURBULENT FLOW, COMBUSTORS, COMPUTATIONS, CONVECTION(HEAT TRANSFER), COOLING, CURVATURE, DIFFUSERS, EXPERIMENTAL DATA, FLOW FIELDS, HIGH TEMPERATURE, INSTRUMENTATION, JET ENGINES, LAYERS, LONG RANGE(TIME), MATHEMATICAL MODELS, NUMERICAL METHODS AND PROCEDURES, SHEAR PROPERTIES, SURFACES, TURBINE BLADES, TURBULENCE.

KESTREL INST PALO ALTO CA

(U) Finding Efficient Pipelining in Concurrent Structures.

DESCRIPTIVE NOTE: Final rept. 15 Jan-14 Dec 86.

JAN 88 54P

IDENTIFIERS: (U) WUAFOSR2307A4, PE61102F.

PERSONAL AUTHORS: King, Richard M.

REPORT NO. KES-U-88-2

CONTRACT NO. F49620-85-C-0015

PROJECT NO. 2304

TASK NO. A5

MONITOR: AFOSR, AFOSR  
TR-89-0212, FR-87-1

UNCLASSIFIED REPORT

ABSTRACT: (U) The focus of our research is the production of concurrent systems from First Order Logic specifications. As we have seen in past years, first order logic is a natural means of specification, especially if we intend to synthesize concurrent computing systems; from these specifications, because it describes the relationship between input and output precisely without making any commitment as to how a satisfying output is to be achieved given an input. In our conception of the synthesis process, the user is asked to specify only that information that allows a system satisfying the user's needs to be distinguished from one that does not by a formal specification of its behavior. From this information, a system that satisfies the specification may be generated using our synthesis techniques. Keywords: Concurrence; Pipelining; Multiprocessors; Multi-processor synthesis; Communication networks. (JES)

DESCRIPTORS: (U) \*COMMUNICATIONS NETWORKS, COMPUTATIONS, DUAL MODE, LOGIC, MULTIPROCESSORS, PRODUCTION, SPECIFICATIONS, STRUCTURES, SYNTHESIS, USER NEEDS.

IDENTIFIERS: (U) WUAFOSR2304A5, PE61102F.

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AD-A210 341 9/1 20/12 12/1  
 POLYTECHNIC UNIV FARMINGDALE NY WEBER RESEARCH INST  
 (U) Physics of High Energy Photoconductive Switches.  
 DESCRIPTIVE NOTE: Final technical rept. 1 Aug 85-30 Sep 88.

JUN 89 25P

PERSONAL AUTHORS: Kunhardt, Erich E.

CONTRACT NO. AFOSR-85-0249

PROJECT NO. 2301

TASK NO. A7

MONITOR: AFOSR  
TR-89-0994

UNCLASSIFIED REPORT

ABSTRACT: (U) During this funding period, a semi-classical macro-kinetic theory that describes the dynamic behavior of carriers in a semiconductor under the influence of space-time varying fields has been formulated. The macro-kinetic model is considerably easier to implement numerically than Monte Carlo methods or those based on the Boltzmann Transport Equation (BTE). Moreover, the macro-kinetic model requires orders of magnitude less computer time to run. A Monte Carlo method has been developed for obtaining the electron energy distribution, transport parameters, and rate coefficients in multi-valley semiconductors. The procedure requires an order of magnitude less time than conventional Monte Carlo techniques. (rh)

DESCRIPTORS: (U) \*BOLTZMANN EQUATION, \*ELECTRIC SWITCHES, \*ELECTRON ENERGY, \*PHOTOCONDUCTIVITY, \*TRANSPORT PROPERTIES, COEFFICIENTS, COMPUTERS, DISTRIBUTION, ELECTRONS, HIGH ENERGY, MONTE CARLO METHOD, PARAMETERS, PHYSICS, RATES, SPACE PERCEPTION TIME, TRANSPORT.

IDENTIFIERS: (U) PE61102F, WUAFOSR2301A7.

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BRISTOL UNIV (ENGLAND) DEPT OF INORGANIC CHEMISTRY

(U) Chemistry of Polynuclear Metal Complexes with Bridging Carbene or Carbyne Ligands. Part 86.  
 Alkylidyne(Carbaborane)Molybdenum-Gold, -Rhodium and Iron Complexes; Crystal Structure of (NEt<sub>4</sub>)(MoFe<sub>2</sub>(μ<sub>3</sub>-CC<sub>6</sub>H<sub>4</sub>Me-4) (μ<sub>3</sub>-Sigma: Sigma: Eta 5 - C<sub>2</sub>B<sub>9</sub>H<sub>7</sub>Me<sub>2</sub>)(CO)<sub>18</sub>),

89

13P

PERSONAL AUTHORS: Devore, David D.; Emmerich, Christiane; Howard, Judith A.; Stone, F. G.

CONTRACT NO. AFOSR-86-0125

PROJECT NO. 2303

TASK NO. B2

MONITOR: AFOSR  
TR-89-0791

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Jnl. of the Chemical Society, p797-807 1989.

ABSTRACT: (U) The alkylidyne-molybdenum complex (NEt<sub>4</sub>)(Mo triple bonded CC<sub>6</sub>H<sub>4</sub>Me<sub>3</sub>-4) (CO) (P(OMe)<sub>3</sub>) eta 5-C<sub>2</sub>B<sub>9</sub>H<sub>7</sub>Me<sub>2</sub>) has been prepared, and used to prepare compounds with bonds between molybdenum and gold, rhodium, and iron: (MoAu(μ<sub>3</sub>-CC<sub>6</sub>H<sub>4</sub>Me-4) (CO) (P(OMe)<sub>3</sub>) (PPh<sub>3</sub>) (eta 5-C<sub>2</sub>B<sub>9</sub>H<sub>7</sub>Me<sub>2</sub>)), (MoRh(μ<sub>3</sub>-CC<sub>6</sub>H<sub>4</sub>Me-4) (μ<sub>3</sub>-CO) - (P(OMe)<sub>3</sub>) (PPh<sub>3</sub>)<sub>2</sub> (eta 5-C<sub>2</sub>B<sub>9</sub>H<sub>7</sub>Me<sub>2</sub>)), and (NEt<sub>4</sub>)(MoFe<sub>2</sub>(μ<sub>3</sub>-CC<sub>6</sub>H<sub>4</sub>Me-4) (μ<sub>3</sub>-sigma: sigma: eta 5-C<sub>2</sub>B<sub>9</sub>H<sub>7</sub>Me<sub>2</sub>)(CO)<sub>18</sub>). The structure of the latter has been established by x-ray diffraction. In the anion a triangle of metal atoms is symmetrically capped on one side by the alkylidyne ligand. On the other side of the triangle the molybdenum atom is eta 5-ligated by the C<sub>2</sub>B<sub>9</sub> cage, but two boron atoms in the pentagonal face are sigma bonded to the two iron atoms. The molybdenum carries two carbonyl groups and each of the iron atoms is bonded by three ligands. The reaction between (Fe<sub>2</sub>(CO)<sub>9</sub>) and (NEt<sub>4</sub>)(Mo(triple bonded CC<sub>6</sub>H<sub>4</sub>Me-4) (CO) (P(OMe)<sub>3</sub>) (eta 5-C<sub>2</sub>B<sub>9</sub>H<sub>7</sub>Me<sub>2</sub>)) also affords the novel mononuclear molybdenum compound (NEt<sub>4</sub>)(Mo(sigma: eta 5-CH(C<sub>6</sub>H<sub>4</sub>Me-4)(C<sub>2</sub>B<sub>9</sub>H<sub>7</sub>Me<sub>2</sub>)(CO)<sub>3</sub>). Reprints (av)

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DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EV109K

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20/6

DESCRIPTORS: (U) \*CARBENES, \*CRYSTAL STRUCTURE, \*GOLD COMPOUNDS, \*IRON COMPOUNDS, \*METAL COMPLEXES, \*MOLYBDENUM COMPOUNDS, \*RHODIUM COMPOUNDS, ATOMS, CHEMISTRY, LIGANDS, METALS, REPRINTS, SIDES, TRIANGLES, X RAY DIFFRACTION, ORGANOMETALLIC COMPOUNDS, CHEMICAL BONDS.

STATE UNIV OF NEW YORK AT BUFFALO DEPT OF CHEMISTRY

(U) Ultrafast Third-Order Non-Linear Optical Processes in Polymeric Films.

IDENTIFIERS: (U) WUAFOSR2303B2, PEB1102F, \*Carbynes, Alkylidyne Carbaboranes.

89 15P

PERSONAL AUTHORS: Prasad, Paras M.

CONTRACT NO. F49620-87-C-0042, NSF-DMR87-15688

PROJECT NO. 2303

TASK NO. A3

MONITOR: AFOSR  
TR-89-0824

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Nonlinear Optical Effects in Organic Polymers, p351-363 1989.

ABSTRACT: (U) This paper includes selective results from our comprehensive program in nonlinear optical effects in organic molecules and polymers. The focus of our study has been on the third order effect. We have calculated microscopic nonlinearities of organic molecules in several series of conjugated structures using ab-initio SCF approach coupled with the finite field method. The effects of increase in the pi-electron conjugation length and molecular conformation, as well as the heavy atom effect and the role of substituents have been investigated in order to derive an understanding of molecular structure-property relation so that structural parameters associated with enhanced optical nonlinearities can be identified. This theoretical study has been complemented with the measurements of optical nonlinearities in subsequently built and systematically derivatized structures. (Reprint)

DESCRIPTORS: (U) \*OPTICAL PROPERTIES, \*POLYMERIC FILMS, \*ORGANIC COMPOUNDS, ATOMS, MICROSCOPY, MOLECULAR STRUCTURE, MOLECULES, NONLINEAR SYSTEMS, ORGANIC COMPOUNDS, PARAMETERS, POLYMERS, REPRINTS, STRUCTURAL PROPERTIES, MOLECULAR PROPERTIES, HIGH VELOCITY

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DTIC REPORT BIBLIOGRAPHY

SEARCH CONTROL NO. EVI09K

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AD-A210 334 20/5 7/4

IDENTIFIERS: (U) PEB1102F, WUAF0SR2303A3, \*Nonlinear Optical Processes, Ultrafast, Third Order Effect, Electron Conjugation, Molecular Conformation.

COLUMBIA UNIV NEW YORK DEPT OF CHEMISTRY  
(U) Dynamics of Flexible Triplet Biradicals.

DESCRIPTIVE NOTE: Rept. for 1987-1988.

JUN 89 8P

PERSONAL AUTHORS: Doubleday, Charles, Jr.; Turro, Nicholas J.; Wang, Jin Feng

CONTRACT NO. AFOSR-88-0043, NSF-CHE84-21140

PROJECT NO. 2303

TASK NO. B2

MONITOR: AFOSR  
TR-89-0922

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Accounts of Chemical Research, v22 n6 p199-205 Jun 89. Sponsored in part by Grant NSF-CHE87-22164.

ABSTRACT: (U) Through a combination of product studies, isotope effects, and transient absorption kinetics including the effect of biradical chain length and substituent, solvent, temperature, and magnetic field, we have made progress in elucidating the relation of the rates and product distributions to the spin interactions in the biradicals. Probably the most surprising result is the profound effect exerted by extremely small interactions such as the S-T gap, SOC, and HFC upon the dynamics and product distribution of triplet biradicals. Keywords: Electron spin; Magnetic field; Magnetic isotope effects. Reprints.

DESCRIPTORS: (U) \*SPIN STATES, \*ATOMIC SPECTROSCOPY, \*EMISSION SPECTRA, \*ISOTOPE EFFECT, RADIATION ABSORPTION, DYNAMICS, ELECTRONS, INTERACTIONS, KINETICS, MAGNETIC FIELDS, MAGNETIC PROPERTIES, REPRINTS, TRANSIENTS

IDENTIFIERS: (U) Triplet Spectra, PEB1102F, WUAF0SR2303B2

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NEW YORK UNIV N Y

(U) Computer-Aided Neuroanatomy: Differential Geometry of Cortical surfaces and an Optimal Flattening Algorithm.

cortex while optimally preserving the metric structure of the original neural surface. As a first step in this work, we have measured the mean and Gaussian curvature at each point of the opercular surface of macaque striate cortex. Reprints. (aw)

MAR 86 11P

PERSONAL AUTHORS: Schwartz, Eric L.; Merker, Bjorn

CONTRACT NO. AFCSR-85-0341, F49620-83-C-0108

PROJECT NO. 2313

TASK NO. A5

MONITOR: AFOSR  
TR-89-0967

DESCRIPTORS: (U) \*ALGORITHMS, \*ANATOMY, \*COMPUTER GRAPHICS, \*IMAGE PROCESSING, \*VISUAL CORTEX, \*COMPUTERIZED SIMULATION, ARCHITECTURE, BRAIN, COMPUTER AIDED DESIGN, COMPUTER APPLICATIONS, DIFFERENTIAL GEOMETRY, HUMANS, IMAGES, MACAQUE MONKEYS, MONKEYS, NERVOUS SYSTEM, NEUROLOGY, PATTERNS, REPRINTS, RETINA, SURFACES, THREE DIMENSIONAL, VISION.

IDENTIFIERS: (U) PE61102F, WUAFOSR2313A5, \*Neuroanatomy, Optimal Flattening Algorithm, Striate Cortex, Gaussian Curvature, Reconstruction, Flat models.

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. In IEEE Computer Graphics and Applications, p38-40 Mar 86. Sponsored in part by Grant NSF-DCR82-03979. Original contains color plates. All DTIC and NTIS reproductions will be in black and white.

ABSTRACT: (U) In this article we review several computer graphics and image processing applications that help us understand the architecture of monkey and human visual cortex. Two general areas are covered. First, computer graphics methods can be used to simulate the patterns of activity that would occur at various levels of the nervous system as a result of the presence of a particular image on the retina. Current understanding of brain architecture is sufficiently advanced to make this a useful exercise. Simulations of several aspects of visual cortex architecture, using real images, are presented. Second, the technical aspects of studying brain architecture involve the reconstruction of patterns of architecture from serial sections. Computer graphics and image processing techniques can make a major contribution to this area by providing methods of reconstructing the three-dimensional surfaces derived from large numbers of serial sections, and also by providing flattened versions of these surfaces. We have termed this area of application computer aided anatomy. We illustrate this methodology by demonstrating an algorithm we have developed that flattens a 3D reconstruction of the opercular surface of monkey striate

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CINCINNATI UNIV OH DEPT OF CHEMISTRY

(U) Comparison of the Voltammetric Behavior of Adsorbed or Dissolved Unsaturated Alcohols at Vacuum-Annealed and Electrochemically Cycled Pt(111) and Pt(Polycrystalline) Electrodes.

89 11P

PERSONAL AUTHORS: Batina, Nikola; Kahn, Bruce E.; Lin, Chiu-Hsun; McCargar, James W.; Salaita, Ghaleb N.

CONTRACT NO. AFOSR-86-0200

PROJECT NO. 2303

TASK NO. A1

MONITOR: AFOSR  
TR-89-0997

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Electroanalysis, v1 p213-221 1989

ABSTRACT: (U) Recent investigations of unsaturated alcohols have focused upon the characterization of molecular layers adsorbed from both aqueous solutions and the neat liquids at Pt(111). The mode of surface attachment was deduced by surface vibrational studies (electron energy-loss spectroscopy, EELS), molecular packing density and elemental composition data (Auger spectroscopy), and electrochemical reactivity (cyclic voltammetry and chronocoulometry). The subject unsaturated alcohols were found to form chemisorbed layers by attachment through the unsaturated moiety. Comparison of the reaction energetics, kinetics, and stoichiometry of the adsorbed layers with the behavior of the same compounds in aqueous solution provides an immediate indication of the extent to which the electrochemical reactivity of dissolved unsaturated alcohols resembles the reactivity of the adsorbed intermediates. The present studies compare the voltammetric behavior of dissolved and adsorbed unsaturated alcohols (alkenes, alkynes, and aromatics) on electrochemically cycled and UHV-annealed Pt(111) surfaces. Also included are voltammetric scans of the

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adsorbed alcohol; at Pt(polycrystalline) (Pt(poly)). Adsorption of the subject unsaturated aliphatic alcohols in this study from dilute aqueous solutions indicates the adsorption of a substantial amount of CO. Keywords: Electrochemistry; Reprints. (KT)

DESCRIPTORS: (U) \*ELECTRODES, \*SURFACE REACTIONS, \*ELECTROCHEMISTRY, ADSORPTION, ALKENES, ALKYNES, AROMATIC COMPOUNDS, ATTACHMENT, PLATINUM, ALCOHOLS, AUGER ELECTRON SPECTROSCOPY, CHRONOMETERS, COULOMETERS, CYCLES, DILUENTS, ELECTRON ENERGY, ELECTRON SPECTROSCOPY, ENERGETIC PROPERTIES, LAYERS, LOSSES, MOLECULAR PROPERTIES, MOLECULES, PACKING DENSITY, REACTIVITIES, REPRINTS, RESPONSE, SOLUTIONS(MIXTURES), STOICHIOMETRY, SURFACES, VIBRATION, VOLTAMMETRY, WATER.

IDENTIFIERS: (U) PE61102F, WUAFOSR2303A1 Pt 111.



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CINCINNATI UNIV OH DEPT OF CHEMISTRY

(U) Structure and Composition of Pt(111) and Pt(100) Surfaces as a Function of Electrode Potential in Aqueous Sulfide Solutions.

89

7P

PERSONAL AUTHORS: Batina, Nikola; McCargar, James W.; Salaita, Ghaieb N.; Lu, Frank; Laguren-Davidson, Laarni

CONTRACT NO. AFOSR-86-0200

PROJECT NO. 2303

TASK NO. A1

MONITOR: AFOSR  
TR-89-0996

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Langmuir, v5 n1 p123-128 1989.

ABSTRACT: (U) Studies are reported in which surface layers formed by immersion of well-defined Pt(111) and Pt(100) electrode surfaces into aqueous Na<sub>2</sub>S solutions were characterized with regard to structure, composition, and reactivity by means of low-energy electron diffraction (LEED), Auger electron spectroscopy, electron energy-loss spectroscopy (EELS), linear scan voltammetry, and coulometry. Voltammetry reveals that only oxidative desorption of S occurs on the Pt surfaces; no S reductive desorption is observed over the useful potential range. Combined surface analysis data (Auger), vibrational spectra (EELS), and structural data (LEED) permit identification of adsorbed layer composition and structure on Pt(111) and Pt(100) surfaces as a function of potential. The best clarity of the LEED patterns is found at pH 9. Potentials more positive than 0.0 V give rise to increasingly diffuse intensity related to oxidative desorption of S. Voltammograms for oxidative adsorption of S from both surfaces are markedly different, indicating different mechanisms of S oxidation at the two surfaces: at pH 9, four voltammetric peaks are present for S at the Pt(111) surface, compared with only one peak for the Pt(100) surface. (jes)

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STANFORD UNIV CA DEPT OF AERONAUTICS AND ASTRONAUTICS

(U) Unsteady Gas Dynamics Problems Related to Flight Vehicles.

SYSTEMS, CURVATURE, FLIGHT, FLUTTER, HARMONICS, AERODYNAMIC LIFT, LIGHTWEIGHT, LINEARITY, MOTION, NONLINEAR SYSTEMS, OPTIMIZATION, OSCILLATION, SOLUTIONS(GENERAL), STABILITY, STRUCTURAL PROPERTIES, THEORY, TRANSIENTS, TRANSONIC FLOW, VEHICLES, VELOCITY, VIBRATION, WINGS.

DESCRIPTIVE NOTE: Final rept. 1 Apr 74-31 Mar 79,

MAY 79

18P

IDENTIFIERS: (U) PE61102F, WUAFOSR2307A1.

PERSONAL AUTHORS: Ashley, Holt

CONTRACT NO. AFOSR-74-2712

PROJECT NO. 2307

TASK NO. A1

MONITOR: AFOSR  
TR-89-0890

UNCLASSIFIED REPORT

ABSTRACT: (U) Report summarizes the findings of a five-year program devoted to improving fundamental knowledge on unsteady aerodynamic phenomena related to flight vehicles and on associated aeroelastic problems. With regard to minimum-weight structural optimization with aeroelastic constraints, both new results and new methods of solution for free and forced motion were published. The effect of chordwise-force components on flutter of large aspect ratio wings proved often to be unfavorable. Improved steady and unsteady theories were published for the loading of vertical-axis wind turbines, and discoveries were made regarding free vibration of their curved blades. It was learned how to adapt linear theory for simple harmonic oscillation to cover arbitrary small motion, with applications to automatic control. A nonlinear approach was published for transient lifting airloads at low speeds. A study was undertaken on aerodynamics useful for the analysis of variable-geometry propulsive devices. An approximate scheme was devised for highlighting the importance of partial-chord shocks for transonic aeroelastic stability, their influence proving often large and unfavorable. (jhd)

DESCRIPTORS: (U) \*AERODYNAMIC LOADING, \*AERODYNAMIC STABILITY, \*AEROELASTICITY, \*UNSTEADY FLOW, AERODYNAMICS, ASPECT RATIO, AUTOMATIC, TURBINE BLADES, FLIGHT CONTROL

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GEORGETOWN UNIV WASHINGTON DC DEPT OF CHEMISTRY

(U) Evaluation of Chemical Research Relevant to Current and Projected U.S. Air Force Interests.

DESCRIPTIVE NOTE: Final rept. 1 Jul 75-1 Jul 79,

JUL 79

2P

PERSONAL AUTHORS: Earley, Joseph E.

CONTRACT NO. F44620-75-C-0001

PROJECT NO. 2303

TASK NO. A1

MONITOR: AFOSR  
TR-89-0883

UNCLASSIFIED REPORT

ABSTRACT: (U) The main activity carried out under this contract has been to evaluate research proposals submitted to the Directorate of Chemical Sciences, AFOSR. This has been carried out by expert scientists, both from Georgetown University faculty and from other university, industry and government laboratories. Eleven main meetings have been held to discuss evaluations of research proposals and also other portions of the AFOSR program. About sixteen university and industrial scientists and ten or more Air Force scientists attended each meeting (see table below). Detailed evaluations of all proposals were provided in written form. (JES)

DESCRIPTORS: (U) \*CHEMISTRY, \*SCIENTISTS, AIR FORCE, INDUSTRIES, INSTRUCTORS, LABORATORIES, SYMPOSIA, UNIVERSITIES.

IDENTIFIERS: (U) PE61102F, WUAFOSR2303A1.

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SRI INTERNATIONAL MENLO PARK CA

(U) Influence of Microstructure and Microdamage Processes on Fracture at High Loading Rates.

DESCRIPTIVE NOTE: Final rept. 1 Feb 86-30 Sep 88,

JUN 89

48P

PERSONAL AUTHORS: Giovanola, J. H.; Kloop, R. W.; Simons, J. W.; Kobayashi, T.; Shockey, D. A.

REPORT NO. TR-90

CONTRACT NO. F49620-86-K-0010

PROJECT NO. 2306

TASK NO. A1

MONITOR: AFOSR  
TR-89-0992

UNCLASSIFIED REPORT

ABSTRACT: (U) The objectives of this three-year program were to establish how microstructure and loading rate influence the fracture behavior of Ti-10V-2Fe-3Al, a promising advanced titanium alloy increasingly used in aircraft structural components, and to relate the macroscopic fracture toughness results to microdeformation and microdamage processes with a view toward developing microstructurally based fracture models. Such models are desirable to develop compositions and processing conditions resulting in optimum mechanical properties. Titanium alloy; Loading rate; Microdeformation; Microstructures; Microdamage; Microstructure models; Fracture behavior. (JES)

DESCRIPTORS: (U) \*AIRCRAFT EQUIPMENT, \*AIRFRAMES, \*ALLOYS, \*MICROSTRUCTURE, \*TITANIUM ALLOYS, FRACTURE(MECHANICS), MECHANICAL PROPERTIES, MODELS, OPTIMIZATION, PROCESSING, RATES.

IDENTIFIERS: (U) WUAFOSR2306A1, LPN-SRI-PYU-1750, PE61102F.

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DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EV109K

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QUALCOMM INC SAN DIEGO CA

(U) Research in Mathematics and Computer Science:  
Calculation of the Probability of Undetected Error for  
Certain Error Detection Codes. Phase 1.

All possible generator polynomial corresponding to 8 and  
16 parity bits and some of the generator polynomials  
corresponding to 24 and 32 parity bits were tested. (KR)

DESCRIPTORS: (U) \*ERROR DETECTION CODES, ALGORITHMS,  
CHANNELS, COMMUNICATION AND RADIO SYSTEMS, COMPUTATIONS,  
COMPUTERS, EFFICIENCY, ERROR CORRECTION CODES,  
OPERATIONAL EFFECTIVENESS, ERRORS, GENERATORS, LENGTH,  
MATHEMATICS, POLYNOMIALS, PROBABILITY, REDUCTION,  
TRANSMITTANCE, VALUE.

DESCRIPTIVE NOTE: Final technical rept. 1 Aug 88-31 Jan  
89.

MAR 89 60P

PERSONAL AUTHORS: Wolf, Jack K.; Fredrickson, Lyle J.;  
Viterbi, Andrew J.

IDENTIFIERS: (U) PE61102F, WUAFOSR3005A1.

CONTRACT NO. F49620-88-C-0088

PROJECT NO. 3005

TASK NO. A1

MONITOR: AFOSR  
TR-89-0841

UNCLASSIFIED REPORT

ABSTRACT: (U) Cyclic redundancy check codes (or CRC  
codes) have become the standard means for insuring the  
integrity of messages that have been transmitted over a  
noisy communications channel. The sole purpose of these  
codes is to detect transmission errors (in contrast to  
error correction codes (or ECC codes) which attempt to  
correct transmissions in errors). Sometimes both CRC and  
ECC codes are utilized and in that case the burden is on  
the CRC code to detect errors that were not correctly  
decoded by the ECC code. Unfortunately, even the very  
best CRC codes cannot detect all transmission errors. The  
probability of CRC failure is called the probability of  
undetected error. The thrust of this study was concerned  
with finding an efficient method of calculating this  
probability of undetected error and then to use this  
method to find good (or even the best) CRC codes. A new  
algorithm was implemented to find good choices for the  
generator polynomial of CRC codes, that is, generator  
polynomials for which the probability of undetected error  
was less than a given bound for all shortened block  
lengths and for all values of the binary symmetric  
channel error rate. Results are given for generator  
polynomials corresponding to 8, 16, 24 and 32 parity bits.

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## SEARCH CONTROL NO. EVI09K

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MINNESOTA MINING AND MFG CO ST PAUL SCIENCE RESEARCH LAB

(U) Applications Requirements for Nonlinear-Optical Devices and the Status of Organic Materials.

APR 89 9P

PERSONAL AUTHORS: Boyd, G. T.

CONTRACT NO. F49620-88-C-0008

PROJECT NO. D812

TASK NO. J1

MONITOR: AFOSR  
TR-89-0802

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Jnl. of the Optical Society of America B, v6 n4 p685-692 Apr 89.

ABSTRACT: (U) The materials requirements for nonlinear optical applications, including electrooptics, second harmonic generation, and all optical signal processing, are discussed. The status of organic materials is reviewed in light of these requirements, along with the needs for future research. Keywords: Nonlinear optics; Electrooptics; Second harmonic generation; All optical signal processing; Reprints. (JHD)

DESCRIPTORS: (U) \*OPTICAL CIRCUITS, \*ELECTROOPTICS, HARMONIC GENERATORS, NONLINEAR SYSTEMS, OPTICAL PROCESSING, OPTICAL PROPERTIES, REPRINTS, REQUIREMENTS, SIGNAL PROCESSING.

IDENTIFIERS: (U) Second Harmonic Generation, PE61102F, WUAFOSRD812J1.

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OKLAHOMA STATE UNIV STILLWATER DEPT OF CHEMISTRY

(U) Intramolecular Energy Transfer and Mode-Specific Effects in Unimolecular Reactions of 1,2-Difluoroethane,

JUN 89 10P

PERSONAL AUTHORS: Raff, Lionel M.

CONTRACT NO. AFOSR-89-0085

PROJECT NO. 2303

TASK NO. B3

MONITOR: AFOSR  
TR-89-1002

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Jnl. of Chemical Physics, v90 n11 p6313-6319, 1 Jun 89.

ABSTRACT: (U) The unimolecular decomposition reactions of 1,2-difluoroethane upon mode-specific excitation to a total internal energy of 7.5 eV are investigated using classical trajectory methods and a previously formulated empirical potential-energy surface. The decomposition channels for 1,2-difluoroethane are, in order of importance, four-center HF elimination, C-C bond rupture, and hydrogen-atom dissociation. This order is found to be independent of the particular vibrational mode excited. Neither fluorine-atom nor F2 elimination reactions are ever observed even though these dissociation channels are energetically open. For four-center HF elimination, the average fraction of the total energy partitioned into internal HF motion varies between 0.115-0.181 depending upon the particular vibrational mode initially excited. The internal energy of the fluoroethylene product lies in the range 0.716-0.776. Comparison of the present results with those previously obtained for a random distribution of the initial 1,2-difluoroethane internal energy shows that numerous mode-specific effects are present in these reactions in spite of the fact that intramolecular energy transfer rates for this system are 5.88-25.5 times faster than any of the unimolecular reaction rates. Mode-specific excitation always leads to a total decomposition

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SEARCH CONTROL NO. EVI09K

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rate significantly larger than that obtained for a random distribution of the internal energy. Excitation of different 1,2-difluoroethane vibrational modes is found to produce as much as a 51% change in the total decomposition rate. Reprints. (aw)

FLORIDA AGRICULTURAL AND MECHANICAL UNIV TALLAHASSEE  
FLUID MECHANICS RESEARC H LAB

(U) Basic Studies of the Unsteady Flow Past High Angle of Attack Airfoils.

DESCRIPTORS: (U) \*ENERGY TRANSFER, \*FLUORINATED HYDROCARBONS, \*ETHANES, \*CHEMICAL REACTIONS, CHANNELS, DECOMPOSITION, CHEMICAL DISSOCIATION, DISTRIBUTION, ENERGY, ETHYLENES, FLUORINE COMPOUNDS, INTERNAL, MOLECULAR PROPERTIES, MOLECULES, RATES, REACTION KINETICS, REACTION TIME, REPRINTS, TRAJECTORIES, MOLECULAR VIBRATION, VIBRATIONAL SPECTRA.

DESCRIPTIVE NOTE: Final rept. 1 Oct 86-30 Oct 88.

MAY 89 132P

PERSONAL AUTHORS: Krothapalli, Anjaneyulu; Lourenco, Luiz; Van Dommelen, Leon

CONTRACT NO. AFOSR-86-0243

PROJECT NO. 2307

TASK NO. A3

MONITOR: AFOSR  
TR-89-0780

UNCLASSIFIED REPORT

IDENTIFIERS: (U) PE81102F, WJAFOSR2303B3,  
\*Difluoroethanes, Ethane/1-2-Difluoro, Fluoroethylene.

ABSTRACT: (U) An experimental and numerical simulations have been carried out to study the unsteady flow past an impulsively started NACA 0012 airfoil at different angles of attack ( $0 < \alpha < 45$  deg.). A novel experimental technique, commonly referred to as Particle Image Displacement Velocimetry (PIDV), is successfully implemented to measure the instantaneous velocity fields. The velocity field is measured with sufficient accuracy so that the distribution of vorticity can be calculated. The unsteady separated flow fields generated by these airfoils contain large scale vortical structures such as; a primary vortex generated at the leading edge of the airfoil with secondary vortices upstream of it; a trailing vortex, and a vortex sheet type structure. The origins and time evolution of these structures are clearly depicted by the instantaneous velocity and vorticity fields. A random-walk vortex simulations of the full Navier-Stokes equations were performed as comparison. Keywords: Unsteady flows; High angle of attack airfoils; Particle image velocimetry; Vortex calculations. (jhd)

DESCRIPTORS: (U) \*AIRFOILS, \*ANGLE OF ATTACK, \*HIGH ANGLES, \*UNSTEADY FLOW, ACCURACY, COMPUTATIONS, DISPLACEMENT, DISTRIBUTION, EVOLUTION(GENERAL), FLOW

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FIELDS, FLOW SEPARATION, IMAGES, LABORATORY PROCEDURES,  
LEADING EDGES, NAVIER STOKES EQUATIONS, NUMERICAL  
ANALYSIS, PARTICLES, SECONDARY FLOW, SHEETS, TIME,  
TRAILING VORTICES, VELOCIMETERS, VELOCITY, VORTICES.

NATIONAL INST OF STANDARDS AND TECHNOLOGY GAITHERSBURG  
MD MOLECULAR SPECTROSCOPY DIV

(U) Energetics and Spin- and Lambda-Doublet Selectivity in  
the Infrared Multiphoton Dissociation DN3 yields DN(X  
3 Sigma(-), a 1 Delta) + N2(X 1 Sigma g (+));  
Experiment,

IDENTIFIERS: (U) NACA 0012 Airfoils, WUAFOSR2307A3,  
PE61102F.

AUG 88 12P

PERSONAL AUTHORS: Stephenson, John C.; Casassa, Michael P.  
; King, David S.

CONTRACT NO. AFOSR-ISSA-89-0022

PROJECT NO. 2303

TASK NO. B1

MONITOR: AFOSR  
TR-89-0431

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Jnl. of Chemical Physics, v89  
n3 p1378-1387, 1 Aug 88.

ABSTRACT: (U) Multiphoton vibrational excitation of  
deuterated hydrazoic acid, DN3, by a CO2 laser (I=10 GW/  
sq.cm.) leads to dissociation forming DN in both X 3  
Sigma(-) (spin forbidden) and a 1 Delta (spin allowed)  
electronic states. Under collisionless conditions, the  
nascent DN fragments were probed via laser induced  
fluorescence, to determine initial product state  
distributions. The DN(X 3 Sigma(-)) molecules are formed  
predominantly in the symmetric F1 and F3 spin-rotation  
states with little population (< or = 6%) in the  
antisymmetric F2 levels. There is no significant  
population (< 3%) in excited DN 3-Sigma(-) vibrational  
levels. The distribution of rotational states is  
Boltzmann-like, characterized by a rotational temperature  
of about 920 K for the F1, F3 states and 500 K for F2  
levels. Doppler profiles showed a large kinetic energy  
release of about 10 100 cm total in the triplet channel.  
The DN(1 Delta) products are formed preferentially in the  
symmetric Delta(A'), e-labeled lambda doublet levels:  
Delta(A')/Delta(A) = 1.44. The DN(1 Delta) is formed with  
no vibrational excitation (<2%); the rotational states

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are populated Boltzmann-like with a rotational temperature of 425 K. Doppler profiles give a total kinetic energy of about 1500/cm in this channel. The observed DN(3 Sigma(-) spin- and DN(1 Delta) Lambda-doublet selectivities reflect the symmetry properties of a planar transition state and that the low degree of DN(3 Sigma(-) rotational and vibrational excitation is also expected from the transition state geometry. Reprints. (jhd)

DESCRIPTORS: (U) \*HYDRAZOIC ACID, \*PHOTODISSOCIATION, DISTRIBUTION, DOPPLER SYSTEMS, ELECTRONIC STATES, ENERGETIC PROPERTIES, ENERGY TRANSFER, EXCITATION, DEUTERIUM COMPOUNDS, KINETIC ENERGY, LASER INDUCED FLUORESCENCE, PHOTONS, POPULATION, PROFILES, REPRINTS, MOLECULAR ROTATION, SYMMETRY, TEMPERATURE, LASER PUMPING, MOLECULAR VIBRATION.

IDENTIFIERS: (U) \*Deuterated Hydrazoic Acid, \*Multiphoton Dissociation, Multiphoton Excitation, Deuterated Compounds, WUAFOSR230381, PE61102F.

AD-A210 242 20/4

JOHNS HOPKINS UNIV BALTIMORE MD DEPT OF MECHANICS AND MATERIALS SCIENCE

(U) Complex Turbulent Flows.

DESCRIPTIVE NOTE: Final rept. 1 May 78-29 Feb 79.

FEB 79 4P

PERSONAL AUTHORS: Kovaszny, Leslie S.

CONTRACT NO. AFOSR-78-3610

PROJECT NO. 2307

TASK NO. A2

MONITOR: AFOSR  
TR-89-0889

UNCLASSIFIED REPORT

DESCRIPTORS: (U) \*TURBULENT FLOW, \*TRANSITIONS, COUETTE FLOW, EXPERIMENTAL DESIGN, TEST FACILITIES, JET FLOW HOT WIRE ANEMOMETERS.

IDENTIFIERS: (U) PE81102F, WUAFOSR2307A2.

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AVCO RESEARCH LAB INC EVERETT MA

OREGON STATE UNIV NEWPORT OR HATFIELD MARINE SCIENCE CENTER

(U) Optical Production of Negative Ions.

DESCRIPTIVE NOTE: Final rept. for 15 Jul 87-14 Dec 88,

FEB 89 31P

PERSONAL AUTHORS: McGeach, M. W.

CONTRACT NO. F49620-87-C-0080

PROJECT NO. 2301

TASK NO. A7

MONITOR: AFOSR  
TR-89-0812

UNCLASSIFIED REPORT

ABSTRACT: (U) A kinetic model of an optically pumped lithium plasma is discussed. Observations of ionization processes at high Rydberg atom density are analyzed, and the role of an electron avalanche process is identified. The optical pump intensity requirements for continuous plasma formation are derived, and Li production is modeled. Keywords: Negative Ions; Lithium; Optical plasma. (jhd)

DESCRIPTORS: (U) \*ANIONS, \*OPTICAL PUMPING, \*PLASMAS(PHYSICS), AVALANCHE EFFECT(ELECTRONICS), INTENSITY, IONIZATION, KINETICS, LITHIUM, MODELS, OPTICAL PROPERTIES, PRODUCTION, REQUIREMENTS.

IDENTIFIERS: (U) \*Optical Plasmas, Rydberg Atoms, PE61102F, WUAFOSR2301A7.

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(U) Parallel Processing and Learning in Simple Systems.

DESCRIPTIVE NOTE: Final rept. 10 Jan 86-14 Jan 89.

MAR 89 6P

PERSONAL AUTHORS: Mpitsos, George J.

CONTRACT NO. AFOSR-86-0076

PROJECT NO. 2312

TASK NO. A1

MONITOR: AFOSR  
TR-89-0809

UNCLASSIFIED REPORT

ABSTRACT: (U) Work over the three-year tenure of this grant has dealt with interrelated studies of 1) neuropharmacology, 2) behavior, and 3) distributed/parallel processing in the generation of variable motor patterns in the buccal-oral system of the sea slug Pleurobranchaea californica. 4) Computer simulations of simple neural networks have been undertaken to examine neurointegrative principles that could not be examined in biological preparations. The simulation work has set the basis for further simulations dealing with networks having characteristics relating to real neurons. All of the work has had the goal of developing interdisciplinary tools for understanding the 'scale-independent' problem of how individuals, each possessing only local knowledge of group activity, act within a group to produce different and variable adaptive outputs, and, in turn, of how the group influences the activity of the individual. The pharmacologic studies have had the goal of developing biochemical tools with which to identify groups of neurons that perform specific tasks during the production of a given behavior but are multifunctional by being critically involved in generating several different behaviors. Keywords: Parallel processing; Distributed networks; Chaos; Noise; Simulated annealing; Neural networks; Muscarinic; Cholinergic; Receptor binding; Associative learning; Invertebrates. (SDW)

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MICHIGAN UNIV ANN ARBOR DEPT OF PHYSICS

DESCRIPTORS: (U) \*DISTRIBUTED DATA PROCESSING, \*LEARNING,  
\*PARALLEL PROCESSING, ADAPTIVE SYSTEMS, ANNEALING,  
ASSOCIATIVE PROCESSING, BIOCHEMISTRY, BIOLOGY,  
COMPUTERIZED SIMULATION, DISTRIBUTION, GROUP DYNAMICS,  
INVERTEBRATES, MOTORS, NERVE CELLS, NETWORKS, NEURAL NETS,  
NEUROLOGY, NEUTRAL, OUTPUT, BEHAVIOR, PATTERNS,  
PHARMACOLOGY, PREPARATION, PRODUCTION, SENSE ORGANS,  
SIMULATION, TOOLS, VARIABLES.

(U) Resonant and Non-Resonant Optical Frequency Mixing in  
Simple Molecular Systems.

DESCRIPTIVE NOTE: Final rept.,

NOV 80 6P

PERSONAL AUTHORS: Ward, J. F.

CONTRACT NO. AFOSR-77-3225

PROJECT NO. 2301

TASK NO. A1

MONITOR: AFOSR  
TR-89-0777

UNCLASSIFIED REPORT

DESCRIPTORS: (U) \*MOLECULAR SPECTROSCOPY, MIXING,  
MOLECULAR VIBRATION, ELECTRONIC STATES, QUANTUM CHEMISTRY.

IDENTIFIERS: (U) Nonlinear Optics, Ab Initio  
Calculations, PEG1102F, WUAFOSR2301A1.

IDENTIFIERS: (U) PEG1102F, WUAFOSR2312A1.

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ARIZONA STATE UNIV TEMPE SEMICONDUCTOR MATERIALS  
RESEARCH LAB

MARTIN MARIETTA LABS BALTIMORE MD

(U) Autonomous Control System for Czochralski Growth of  
LEC GaAs.

(U) High-Strain-Rate Behavior of Hydrated Cement Paste.

DESCRIPTIVE NOTE: Final technical rept.,

89 29P

MAY 89

PERSONAL AUTHORS:

Schwuttke, G. H.

PERSONAL AUTHORS: Ritter, A.; Childs, G.; Bridger, K.;  
Winzer, S.; Barker, D.

CONTRACT NO. F49620-86-C-0012

REPORT NO. MML-TR-89-56C

MONITOR: AFOSR

CONTRACT NO. F49629-86-C-0021

TR-89-0801

PROJECT NO. 2302

UNCLASSIFIED REPORT

TASK NO. C2

MONITOR:

AFOSR

TR-89-0927

UNCLASSIFIED REPORT

ABSTRACT: (U) The consolidation of the Czochralski  
Growth Control System(CGCS) is a revision of the hardware  
and software within the constraints of the first  
generation. The consolidation consists of: a cabinet that  
is physically more compatible with the Cambridge console;  
a more modular hardware arrangement that facilitates  
calibration, servicing, and expansion; increased accuracy  
and stability of the system variable measurements; and  
many software enhancements, including increased  
controller flexibility and improved diameter estimation  
and control. The hardware and software installation has  
been completed and crystal growth with complete digital  
control has been demonstrated. Keywords: Liquid  
encapsulated crystal; Single crystal; Crystal growth;  
Gallium arsenide. (Jhd)

DESCRIPTORS: (U) \*CRYSTAL GROWTH, \*CZOCCHRALSKI CRYSTALS,  
ACCURACY, CALIBRATION, COMPUTER PROGRAMS, CONTROL,  
CONTROL SYSTEMS, DIGITAL SYSTEMS, ENCAPSULATION, GALLIUM  
ARSENIDES, INSTALLATION, MEASUREMENT, SINGLE CRYSTALS,  
VARIABLES.

IDENTIFIERS: (U) \*Liquid Encapsulated Crystals, PE61102F.

ABSTRACT: (U) Concrete paste and mortar were studied at  
intermediate to high strain-rates and peak pressures up  
to 150 kbar, to determine how the microstructure responded  
to dynamic loading. Intermediate response was primarily  
brittle failure, while high strain-rate (shock) loads  
induced micro cracking, particle size reduction, lattice  
distortion and alteration and/or elimination of porosity.  
Effects were isolated by comparing explosively-loaded  
specimens with unshocked reference materials, using X ray  
diffraction, scanning electron microscopy, and mercury  
porosimetry. Cement microstructure; Dynamic loading;  
Shock effects; Concrete. (Jes)

DESCRIPTORS: (U) \*CEMENTS, CONCRETE, DISTORTION, DYNAMIC  
LOADS, ELECTRON MICROSCOPY, ELECTRONIC SCANNERS,  
ELIMINATION, HYDRATES, LATTICE DYNAMICS, MATERIALS,  
MICROSTRUCTURE, PARTICLE SIZE, PEAK VALUES, POROSITY,  
PRESSURE, REDUCTION, RESPONSE, SHOCK, X RAY DIFFRACTION

IDENTIFIERS: (U) PE61102F, WUAFOSR2302C2, \*Cement paste

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KENTUCKY UNIV LEXINGTON DEPT OF STATISTICS

GEORGIA UNIV ATHENS DEPT OF PHYSICS AND ASTRONOMY

(U) Life Testing, Reliability, and Multivariate Nonparametric Methods.

(U) Band Calculations on Ferroelectric and Piezoelectric Solids.

DESCRIPTIVE NOTE: Final scientific rept..

DESCRIPTIVE NOTE: Final rept. 1 Jun 77-1 Oct 78.

FEB 79

JAN 79

PERSONAL AUTHORS: Blumenthal, Saul; Bhapkar, V. P.

PERSONAL AUTHORS: Henkel, J. H.; Uzes, C. A.; Lee, M. H.

CONTRACT NO. AFOSR-75-2841

CONTRACT NO. AFOSR-76-3045

PROJECT NO. 2304

PROJECT NO. 2305

TASK NO. A5

TASK NO. B2

MONITOR: AFOSR

MONITOR: AFOSR

TR-89-0874

TR-89-0875

UNCLASSIFIED REPORT

UNCLASSIFIED REPORT

ABSTRACT: (U) Since the grant involves two distinct projects, this report is divided into two sections, number I dealing with the work of the principal investigator, and number II dealing with the co-investigator's research. Contents: I) Screening and Estimation Procedures for the Unknown Number of Defective Items in a Life Test, and Estimation of the Size of a Finite Population; and Multivariate Nonparametric Methods for Several Samples. (KR)

DESCRIPTORS: (U) \*MULTIVARIATE ANALYSIS, \*NONPARAMETRIC STATISTICS, ESTIMATES, LIFE TESTS, POPULATION, RELIABILITY.

IDENTIFIERS: (U) PE61102F, WUAFOSR2304A5

ABSTRACT: (U) The main objectives of the original proposal were to calculate spontaneous and other polarization properties of polar and piezoelectric crystals. The purpose of the work was to aid in selecting the best piezoelectric materials to be used in piezoelectric image tubes. The crystals for which the main work effort was directed were:  $\text{NaNbO}_3$ ,  $\text{BN}$ ,  $\text{LiNbO}_3$  and  $\text{KNbO}_3$ . Using charge densities obtained from band calculations with this program, the following piezoelectric coefficients  $d_{21}$ ,  $d_{22}$ , and  $d_{23}$  for sodium nitrate have been calculated. This was accomplished by calculating the changes in the electric polarization of sodium nitrate for three different strains. The plain-wave Gaussian mixed basis method has been employed to calculate crystalline energy bands for cubic boron nitride (zinc-blende structure). These calculations agree favorably with experiment. The spontaneous polarization of  $\text{LiNbO}_3$  has been calculated and the value differs by 20 percent from the experimental value. Because Lithium Niobate contains so many electrons in a unit cell we were not able to do a thorough calculation on  $\text{LiNbO}_3$  as was done on  $\text{NaNbO}_3$ . (JHD)

DESCRIPTORS: (U) \*FERROELECTRIC MATERIALS, \*PIEZOELECTRIC CRYSTALS, \*PIEZOELECTRIC MATERIALS, \*SODIUM NITRATE, \*BAND THEORY OF SOLIDS, CELLS, CHARGE

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DENSITY, CRYSTALS, ELECTRICITY, ENERGY BANDS, IMAGE TUBES,  
LITHIUM NIOBATES, NITRIDES, PHYSICAL PROPERTIES,  
POLARIZATION, PYROELECTRICITY, SODIUM COMPOUNDS.

ILLINOIS UNIV AT URBANA LASER AIDED MATERIALS PROCESSING  
LAB

IDENTIFIERS: (U) PE61102F, WUAFOSR2305B2.

(U) Laser Cladding of Ni, Nb, and Mg Alloys for Improved  
Environmental Resistance at High Temperature.

DESCRIPTIVE NOTE: Final rept. Nov 85-Oct 88.

JAN 89

PERSONAL AUTHORS: Mazumder, J.; Sircar, S.; Kar, A.;  
Ribaud, C.; Lober, R.

CONTRACT NO. AFOSR-85-0333

MONITOR: AFOSR  
TR-89-0778

UNCLASSIFIED REPORT

ABSTRACT: (U) This report summarizes experimental and theoretical studies carried out during the period of November 1985 to October 1988 on laser surface modification of Nickel, Niobium, and Magnesium alloys for improved environmental resistance at high temperature. Major emphasis has been on Ni-Cr-Al-Hf system. Microstructural evolution and oxidation properties of Ni and Nb alloys were examined. For Mo alloys microstructural characterization and potentiodynamic corrosion testing were carried out. One-dimensional diffusion model for finite domain to examine the extended solid solubility in laser cladding was also developed. (JES)

DESCRIPTORS: (U) \*ALLOYS, \*CLADDING, DIFFUSION, ENVIRONMENTS, EVOLUTION(GENERAL), EXPERIMENTAL DATA, HIGH TEMPERATURE, LASERS, MAGNESIUM ALLOYS, MICROSTRUCTURE, MODELS, MODIFICATION, NICKEL, NIOBIUM, ONE DIMENSIONAL, OXIDATION, RESISTANCE, SOLIDS, SOLUBILITY, SURFACES, THEORY.

IDENTIFIERS: (U) WUAFOSR2306A1, PE61102F, \*Laser cladding.

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TEXAS UNIV AT AUSTIN GEOTECHNICAL ENGINEERING CENTER

(U) High-Amplitude Mobile Vibrator for Exciting Body and Surface Waves in Soil, Pavement And Structural Systems.

DESCRIPTIVE NOTE: Final technical rept. Oct 86-Dec 88.

JUN 89

PERSONAL AUTHORS: Stokoe, Kenneth H., II

CONTRACT NO. AFOSR-87-0056

PROJECT NO. 2917

TASK NO. A1

MONITOR: AFOSR  
TR-89-0833

UNCLASSIFIED REPORT

ABSTRACT: (U) A servo-hydraulic vibrator mounted on a transport vehicle was purchased from Teledyne Exploration, Corp. of Houston, TX. The vibrator was modified by Heaviquip, Inc. of Newkirk, OK to improve its performance in the low frequency range, 0.5 to 10 Hz. The resulting system has: 1) a gross vehicle weight of approximately 44,000 lb; 2) a useable frequency range of about 0.5 to 250 Hz; and 3) a peak vertical force (estimated) of about 34,500 lb at frequencies above 5 Hz. The general function of the vibrator is the application of vertical steady-state, multiple-pulse or swept-sine loads to surface or embedded platens in geotechnical, pavement and structural systems. This equipment will form a key component in conducting field studies involving wave propagation in geotechnical materials to investigate: 1) the effect of stress state on the velocity of small-strain body waves; 2) nonlinear body wave propagation; and 3) the dispersive characteristics of surface waves. Keywords: Mechanical vibrators; Pulse generators; Field instrumentation; Seismic source; Mobile vibratory system; Servo-hydraulic vibrator; Field seismic testing; Surface seismic waves; body seismic waves. (EDC)

DESCRIPTORS: (U) \*SEISMIC WAVES, \*VIBRATORS(MECHANICAL), DISPERSING, FIELD EQUIPMENT, FIELD TESTS, FREQUENCY, FUNCTIONS, HYDRAULIC SERVOMECHANISMS, INSTRUMENTATION,

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CARNEGIE-MELLON UNIV PITTSBURGH PA DEPT OF MECHANICAL  
ENGINEERING

LOADS(FORCES), NUMERICAL ANALYSIS, PATHS, STRESS  
CONCENTRATION, STRESSES, THERMAL CYCLING TESTS, THERMAL  
FATIGUE, THERMAL PROPERTIES, THERMAL STRESSES,  
THERMOMECHANICS, TIME, TRANSIENTS.

(U) The Effect of Transients on Crack Tip Stress Fields  
during Thermal Fatigue Loading.

DESCRIPTIVE NOTE: Final rept. 1 Apr 86-31 Mar 89.

IDENTIFIERS: (U) PEG1102F, WUAFOSR230382.

APR 89

PERSONAL AUTHORS: Griffin, J. H.; Cunningham, S. E.

CONTRACT NO. AFOSR-88-0113

PROJECT NO. 2302

TASK NO. B2

MONITOR: AFOSR  
TR-89-0684

UNCLASSIFIED REPORT

ABSTRACT: (U) A method is developed for evaluating the effect of cyclic thermal loading on crack tip stress fields. In its development, advantage is taken of the periodic nature of fatigue loading and only harmonic loadings are considered. Formulating the problem in this way permits the extraction of time as an explicit variable and replaces its role with a dependence on the frequency of the thermal loading. The means for evaluating the effect of thermal transients on crack tip stress fields is the stress intensity factor which is calculated from numerically defined stress and displacement fields using a path independent integral. Results obtained indicate that stress intensity factors of cracked components exposed to thermal fatigue conditions have a significant dependence on the frequency of the thermal cycle and the crack geometry. Numerical estimates for Mode I thermal stress intensity have been obtained for the case of a titanium alloy that was heated using intense light sources. Thermal mechanical fatigue, Fracture mechanics, Thermal stress, Thermal transients. (jes)

DESCRIPTORS: (U) \*ALLOYS, \*TITANIUM ALLOYS, CRACKS,  
DISPLACEMENT, ESTIMATES, EXTRACTION, FATIGUE(MECHANICS),  
FRACTURE(MECHANICS), GEOMETRY, INTENSITY, LIGHT SOURCES.

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CALIFORNIA UNIV SAN DIEGO LA JOLLA DEPT OF CHEMISTRY

SMITH-KETTLEWELL EYE RESEARCH FOUNDATION SAN FRANCISCO CA

(U) Sigma Bond Metathesis Reactions of Si-H and M-Si Bonds.  
New Routes to d(O) Metal Silyl Complexes.

89

PERSONAL AUTHORS: Woo, Hee-Gueon; Tilley, T. D.

PERSONAL AUTHORS: Welch, Leslie

CONTRACT NO. AFOSR-88-0273

CONTRACT NO. AFOSR-89-0035

PROJECT NO. 2303

PROJECT NO. 2313

TASK NO. B2

TASK NO. A5

MONITOR: AFOSR  
TR-89-0817MONITOR: AFOSR  
TR-89-0811

UNCLASSIFIED REPORT

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SUPPLEMENTARY NOTE: Pub. in Jnl. of The American Chemical Society, v111 p3757-3758 1989.

SUPPLEMENTARY NOTE: Pub. in Nature v337 n6209, 23 Feb 89.

ABSTRACT: (U) The D metal silyl complexes CpCp\*MSi(SiMe3)3 Cl(1,Zr; 4,M= Hf; Cp= eta 5 -C5H5; Cp\* = eta 5-C5Me5) react with PhSiH3 via a Sigma bond metathesis process to give CpCp\*MSiH2Ph)Cl(2,M=Zr;5,M=Hf) and HSi(SiMe3)3. These reactions occur via both thermal and photochemical (normal fluorescent room light) pathways. The new silyl complexes 2 and 5 decompose thermally to the hydrides CpCp\* MHC1n and polysilanes SiHPhm, but 5 was isolated and completely characterized. These q-bond metathesis reactions have been shown to provide general routes to a range of stable hafnium silyl complexes of the type CpCp\*HfSiHRRc1, where - SiHRR is a primary or secondary silyl group. Keywords: Silicon Compounds, Methyl radicals, hafnium compounds, metal Complexes, Silanes, Reprints. (aw)

DESCRIPTORS: (U) \*METAL COMPLEXES, \*SILANES, \*SYNTHESIS(CHEMISTRY), \*THERMOCHEMISTRY, \*PHOTOCHEMICAL REACTIONS, CHEMICAL BONDS, CHEMICAL REACTIONS, FLUORESCENCE, HAFNIUM COMPOUNDS, HEAT, HYDRIDES, LIGHT, METHYL RADICALS, POLYSILANES, REPRINTS, SILICON COMPOUNDS, SPACE(ROOM).

IDENTIFIERS: (U) PEB1102F, WUAFOSR2303B2, \*Metal Silyl Complexes, Silyl Radicals, Sigma Bonds, Metathesis.

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AD-A210 057 8/11 17/10

DESCRIPTORS: (U) \*MOTION, \*VISUAL PERCEPTION, AMBIGUITY, APERTURES, DISCRIMINATION, DRIFT, GRATINGS(SPECTRA), HUMANS, IMAGES, MODELS, ONE DIMENSIONAL, REPRINTS, STAGING, SUPPORTS, VELOCITY, VISION.

SOUTHERN METHODIST UNIV DALLAS TX DEPT OF GEOLOGICAL SCIENCES

(U) Deterministic and Stochastic Wavefields in the Near-Field from Explosive Sources.

IDENTIFIERS: (U) PE61102F, WUAF0SR2313A5.

DESCRIPTIVE NOTE: Final technical rept. 15 Oct 87-14 Apr 89.

MAY 89

PERSONAL AUTHORS: Stump, Brian W.; Grant, L.; Bogaards, M.; Flynn, E.; Reinke, R.

REPORT NO. SMUG-5

CONTRACT NO. AFOSR-84-0016

PROJECT NO. 2309

TASK NO. A2

MONITOR: AFOSR  
TR-89-0845

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Master's thesis.

ABSTRACT: (U) An experimental technique for characterizing the seismic source from chemical explosions in different geological material is presented. The specific example of an explosion in alluvium is given. The importance of a complete seismic site characterization prior to the experiment is emphasized. This characterization must include determination of both compressional and shear properties at the test site. Keywords: Seismology; Explosion source; Moment tensors; Inversion; Seismic modeling. (Jhd)

DESCRIPTORS: (U) \*ALLUVIUM, \*EXPLOSIONS, \*SEISMIC WAVES, CHEMICAL REACTIONS, COMPRESSIVE PROPERTIES, GEOLOGY, MATERIALS, MODELS, MOMENTS, SEISMOLOGY, SHEAR PROPERTIES, SITES, SOURCES, TENSORS, TEST FACILITIES.

IDENTIFIERS: (U) PE61102F, WUAF0SR2309A2.

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GEORGE MASON UNIV FAIRFAX VA CENTER FOR COMPUTATIONAL STATISTICS

(U) Hyperdimensional Data Analysis and Structural Inference.

DESCRIPTIVE NOTE: Final technical rept. 1 Apr 87-31 Mar 89.

MAY 89

PERSONAL AUTHORS: Weaman, Edward J.

CONTRACT NO. AFOSR-87-0179

PROJECT NO. 2304

TASK NO. A5

MONITOR: AFOSR  
TR-89-0914

UNCLASSIFIED REPORT

ABSTRACT: (U) This research project was based on belief that modern technology has substantially changed the flavor of problems being presented to the statistician. Electronic instrumentation implies an ability to acquire a large amount of high dimensional data very rapidly. While such capabilities have existed for some time, the emergence of cheap RAM in the 1980's has given us the ability to store and access that data in an active computer memory. This represents a challenge for statisticians which is substantially different in kind. The majority of existing methodology is focused on the univariate, iid random variable model. Even in the circumstance that a multivariate model is allowed, it is usually assumed to be multivariate normal. While arbitrary sample size is frequently assumed, the truth of the matter is that these techniques implicitly assume small to moderate sample sizes. For example, a regression problem with 5 design variables and 1000 observations would represent no problem for traditional techniques. By contrast, a regression problem with 40,000 design variables and 8 million observations would. The reason is clear. In the former case the emphasis is on statistical efficiency which is the operational goal for most current statistical technology. By contrast, in the latter case,

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emphasis must be clearly on computational efficiency. The emphasis on parsimony in many contemporary books and papers is a further reflection of the mind-set that implicitly focuses on small to moderate sample sizes since few parameters do not make sense in the context of very large sample sizes. Finally, we note that the very fact of largeness in sample size implies that it is unlikely we would see iid homogeneity. (jhd)

DESCRIPTORS: (U) \*COMPUTER APPLICATIONS, \*STATISTICAL SAMPLES, \*MULTIVARIATE ANALYSIS, \*STATISTICAL INFERENCE, COMPUTATIONS, EFFICIENCY, ELECTRONIC EQUIPMENT, INSTRUMENTATION, MATHEMATICAL MODELS, MEMORY DEVICES, MODELS, RANDOM ACCESS COMPUTER STORAGE, REGRESSION ANALYSIS, STATISTICS, VARIABLES.

IDENTIFIERS: (U) PE61102F, WUAFOSR2304A5.

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STANFORD UNIV CA INFORMATION SYSTEMS LAB IDENTIFIERS: (U) PE61102F, WUAFOSR2004A6.

(U) Studies in Statistical Signal Processing.

DESCRIPTIVE NOTE: Final technical rept. 1 Jul 83-30 Jun 88.

JUN 88

PERSONAL AUTHORS: Kallath, Thomas

CONTRACT NO. AFOSR-83-0228

PROJECT NO. 2304

TASK NO. A6

MONITOR: AFOSR  
TR-89-0916

UNCLASSIFIED REPORT

ABSTRACT: (U) The primary objective of our research is to develop efficient and numerically stable algorithms for nonstationary signal processing problems by understanding and exploiting special structures, both deterministic and stochastic, in the problems. We also strive to establish and broaden links with related disciplines, such as cascade filter synthesis, scattering theory, numerical linear algebra, and mathematical operator theory for the purpose of cross fertilization of ideas and techniques. These explorations have led to new results both in estimation theory and in these other fields, e.g., to new algorithms for triangular and QR factorization of structured matrices, new techniques for root location and stability testing, new recursions for orthogonal polynomials on the unit circle and the real line as well as on other curves, and new approaches to overcome singularities and ill-conditioning in the recursions. (RH)

DESCRIPTORS: (U) \*ALGORITHMS, \*ESTIMATES, \*LINEAR ALGEBRA, \*NUMERICAL ANALYSIS, \*POLYNOMIALS, \*SIGNAL PROCESSING, \*STABILITY, \*STATISTICAL PROCESSES, CIRCLES, FILTERS, MATHEMATICS, OPERATORS(MATHEMATICS), ORTHOGONALITY, POSITION(LOCATION), SCATTERING, STRUCTURES, SYNTHESIS, TEST AND EVALUATION, THEORY.

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MICHIGAN UNIV ANN ARBOR DEPT OF AEROSPACE ENGINEERING

NORTHWESTERN UNIV EVANSTON IL DEPT OF MECHANICAL ENGINEERING

(U) Study of the Design and Performance Characteristics of Aircraft Simulators.

(U) Monte Carlo Reliability Analysis.

DESCRIPTIVE NOTE: Final rept. 5 Jan 77-4 Sep 78,

DESCRIPTIVE NOTE: Final rept. 1 Jul 84-31 Dec 88,

FEB 79

APR 89

PERSONAL AUTHORS: Cyrus, Michael L.; Fogarty, Laurence

PERSONAL AUTHORS: Lewis, Elmir E.

CONTRACT NO. AFOSR-77-3245

CONTRACT NO. AFOSR-84-0340

MONITOR: AFOSR  
TR-89-0887

PROJECT NO. 2304

TASK NO. A5

## UNCLASSIFIED REPORT

ABSTRACT: (U) Hardware components of the Advanced Simulator for Pilot Training (ASPT) were studied during this period and an interim technical report was issued. An examination of the ASPT platform motion system was accomplished and reported to an Advisory Board convened to study the procurement of motion bases for upcoming training simulators. This work was additionally beneficial to the AFHRL/FT conversion of one ASPT-37 cockpit to an A-10 configuration. A paper entitled 'Advance Simulation for New Aircraft', presented at the 11th NTEC/Industry Conference on 15 November 1978, is included. Keywords: Flight simulators; Air Force training. (edc)

DESCRIPTORS: (U) \*FLIGHT SIMULATORS, AIR FORCE TRAINING, FLIGHT TRAINING, MOTION, PILOTS, PLATFORMS, SIMULATION, TRAINING DEVICES.

IDENTIFIERS: (U) ASPT(Advanced Simulators for Pilot Training), PE61102F.

MONITOR: AFJSR  
TR-89-0915

## UNCLASSIFIED REPORT

ABSTRACT: (U) The research resulted in major improvements in Markov models to be used in Monte Carlo modeling of reliability problems. These include a number of component dependency models and modeling of unrevealed failures. A new sampling technique, the method of self-transitions, is developed for treating time dependent failure rates, and non Markovian generalizations are made to model replacement of ageing parts and as-good-as-new repair. Keywords: Reliability; Monte Carlo simulation. (jhd)

DESCRIPTORS: (U) \*MATHEMATICAL MODELS, \*MONTE CARLO METHOD, \*RELIABILITY, FAILURE, MARKOV PROCESSES, RATES, REPLACEMENT, SAMPLING, SIMULATION, TIME DEPENDENCE.

IDENTIFIERS: (U) PEG1102F, WUAFOSR2304A5.

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NEW YORK UNIV N Y

(U) Psychophysical Studies of Shape with Fourier Descriptor Stimuli.

88

PERSONAL AUTHORS: Schwartz, Eric

CONTRACT NO. AFOSR-85-0341

PROJECT NO. 2313

TASK NO. A5

MONITOR: AFOSR  
TR-89-0974

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Perception, v17 p191-202 1988.

ABSTRACT: (U) The Fourier descriptor (FD) method of shape representation provides a convenient description for the outlines of shapes. It can also be used to generate orthogonal patterns (FD stimuli) which are uniquely characterized by their frequency, amplitude, and phase. Psycho-physical studies were conducted to assess threshold tuning properties and frequency specificity during adaptation to FD stimuli. The results suggest the operation of filters which are characterized by the parameter curvature frequency. Reprints, Visual perception. (JHD)

DESCRIPTORS: (U) \*FOURIER ANALYSIS, \*VISUAL PERCEPTION, CURVATURE, FILTERS, OPERATION, ORTHOGONALITY, PATTERNS, PSYCHOPHYSICS, REPRINTS, SHAPE, STIMULI, THRESHOLD EFFECTS, TUNING.

IDENTIFIERS: (U) PEB1102F, WUAFOSR2313A5.

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NEW YORK UNIV NY COURANT INST OF MATHEMATICAL SCIENCES

(U) Conformal Image Warping.

DESCRIPTIVE NOTE: Technical rept.,

OCT 88

PERSONAL AUTHORS: Schwartz, Eric

CONTRACT NO. AFOSR-85-0341

PROJECT NO. 2313

TASK NO. A5

MONITOR: AFOSR  
TR-89-0973

UNCLASSIFIED REPORT

ABSTRACT: (U) This report describes numerical and computer graphic methods for conformal image mapping between two simply connected regions. The immediate motivation for this application is that the visual field is represented in the brain by mappings which are, at least approximately, conformal. Thus in order to simulate the imaging properties of the human visual system (and perhaps other sensory systems), conformal image mapping is a necessary technique. There are two distinct aspects to this problem: first, one must implement a numerical or analytic method which allows for the computation of a given conformal mapping, constrained by the shape of the two simply connected regions (hereafter known simply as regions) to be mapped, and by a single point and orientation correspondence between them; second, it is necessary to apply a space variant texture mapping algorithm to warp the image, once the mapping itself has been specified. These algorithms are illustrated with examples of conformal mappings constructed analytically from elementary mappings such as the linear fractional map, the complex logarithm, etc. Applications are shown of numerically generated maps between highly irregular regions, and also are shown of the visual field mapping which motivates this work. (JHD)

DESCRIPTORS: (U) \*COMPUTER GRAPHICS, \*CONFORMAL MAPPING, ALGORITHMS, COMPUTER APPLICATIONS, CONFORMAL STRUCTURES,

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GRAPHICS, HUMANS, IMAGES, LOGARITHM FUNCTIONS, MAPPING, MAPS, MATHEMATICAL ANALYSIS, MOTIVATION, NUMERICAL METHODS AND PROCEDURES, ORIENTATION(DIRECTION), REGIONS, SENSES(PHYSIOLOGY), SHAPE, VISION.

NEW YORK UNIV NY COURANT INST OF MATHEMATICAL SCIENCES  
(U) Computing Minimal Distances on Arbitrary Polyhedral Surfaces.

IDENTIFIERS: (U) Symm Algorithm, Texture, PE61102F,  
WUAFOSR2313A5.

DESCRIPTIVE NOTE: Technical rept.,

JAN 87

PERSONAL AUTHORS: Schwartz, Eric

REPORT NO. TR-274, RR-96

CONTRACT NO. AFOSR-85-0341

PROJECT NO. 2313

TASK NO. A5

MONITOR: AFOSR  
TR-89-0971

UNCLASSIFIED REPORT

ABSTRACT: (U) We have implemented an algorithm that makes iterative use of the law of cosines to find all the minimal (geodesic) distances in an arbitrary (that is, non-convex) three-dimensional polyhedral surface. The algorithm is intrinsically parallel, inasmuch as it deals with all nodes simultaneously. It has let us obtain very satisfactory flattening of biological (monkey visual cortex) surfaces consisting of several thousand triangular faces, by providing a full characterization of the distance geometry of these surfaces. (KR)

DESCRIPTORS: (U) \*ALGORITHMS, \*COMPUTATIONS,  
\*RANGE(DISTANCE), GEOMETRY, ITERATIONS, MONKEYS, NODES,  
VISUAL CORTEX, THREE DIMENSIONAL.

IDENTIFIERS: (U) PE61102F, WUAFOSR2313A5, \*Polyhedral Surfaces.

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NEW YORK UNIV NY COURANT INST OF MATHEMATICAL SCIENCES

(U) The Generalized Map Makers Problem: Optimal Flattening of Polyhedral Surfaces.

JAN 87

PERSONAL AUTHORS: Schwartz, Eric

REPORT NO. TR-273, RR-95

CONTRACT NO. AFOSR-85-0341

PROJECT NO. 2313

TASK NO. A5

MONITOR: AFOSR  
TR-89-0980

UNCLASSIFIED REPORT

ABSTRACT: (U) The authors' concern is to 'unfold' and flatten the curved, convoluted surfaces of the brain in order to study the functional architectures and neural maps embedded in them. In order to do this, it is necessary to solve the general map makers problem for representing curved surfaces by quasi-isometric planar models. This algorithm has applications in areas other than computer aided neuroanatomy, such as robotics motion planning and geophysics. The algorithm the author has written maximizes the goodness of fit of distances in these surfaces, to those in a planar configuration of points. He illustrates this algorithm with a flattening of monkey visual cortex, which is an extremely complex, folded surface. Found are distance errors in the range of several percent, with isolated regions of larger error, for the class of cortical surfaces so far studied. (kr)

DESCRIPTORS: (U) \*ALGORITHMS, \*BRAIN, \*MAPPING, ANATOMY, ARCHITECTURE, COMPUTER AIDED DESIGN, CURVATURE, ERRORS, GEOPHYSICS, ISOLATION, MAPS, MONKEYS, MOTION, PROBLEM SOLVING, NERVOUS SYSTEM, NEUROLOGY, PLANNING, RANGE(DISTANCE), REGIONS, ROBOTICS, SURFACES, VISUAL CORTEX.

IDENTIFIERS: (U) PEG1102F, WUAFOSR2313A5.

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CINCINNATI UNIV OH DEPT OF CHEMISTRY

(U) Comparison of Vacuum-Annealed and Electrochemically Cycled Electrodes in Adsorption and Electrocatalysis: Aromatic Compounds at Platinum(111) and Polycrystalline Platinum.

89

PERSONAL AUTHORS: Gui, John Y.; Kahn, Bruce E.; Laguren-Davidson, Laarni; Lin, Chiu-Hsun; Lu, Frank

CONTRACT NO. AFOSR-86-0200

PROJECT NO. 2303

TASK NO. A1

MONITOR: AFOSR  
TR-89-0925

UNCLASSIFIED REPORT

ABSTRACT: (U) These studies compare adsorbed layer vibrational spectra and packing densities of various aromatic compounds at annealed platinum(111) and polycrystalline Pt surfaces (Pt(poly)) with the behavior of surfaces pretreated by electrochemical cycling (the oxidation-reduction procedure commonly employed to pretreat electrodes prior to use). Surface structural changes produced by cycling exert a profound effect upon each of the properties studied. Absorbates studied represent various types of surface attachment: hydroquinone (HQ), which displays pi-bonding to Pt surfaces (horizontal orientation) when adsorbed from sufficiently dilute aqueous solutions; 2,2',5,5'-tetrahydroxybiphenyl (THBP), which adopts a mixture of horizontal and vertical orientations; 3-thiophenecarboxylic acid (3TCA), (3-pyridyl) hydroquinone (3PHQ), and nicotinic acid (NA), which exhibit primarily sigma-bonding (tilted vertical orientation); and benzyl mercaptan (BM) and 2,5-dihydroxy-4-methylbenzyl mercaptan (DMBM), for which attachment occurs through a sulfur atom to form a benzyl pendant. Packing densities (moles adsorbed per unit area) were measured for each compound at each surface by Auger spectroscopy. Surface vibrational spectra were obtained by electron energy loss spectroscopy (EELS) and were assigned by comparison with

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the IR spectra of the pure compounds. Substrate surfaces were characterized by LEED. Cycling the Pt(111) surface affects the adsorbate packing density by up to 50%, while smaller effects are observed for Pt(poly). Cycling causes the LEED pattern of the Pt(111) substrate to become diffuse. Reprints. (AW)

VANDERBILT UNIV NASHVILLE TN DEPT OF CHEMISTRY

(U) Ab Initio Computation of Silicon-29 Nuclear Magnetic Resonance Chemical Shifts for a Range of Representative Compounds,

89

DESCRIPTORS: (U) \*ADSORPTION, \*AROMATIC COMPOUNDS, \*CATALYSIS, \*ELECTRODES, \*PACKING DENSITY, \*VIBRATIONAL SPECTRA, ABSORBERS(MATERIALS), ANNEALING, ATOMS, ATTACHMENT, AUGER ELECTRON SPECTROSCOPY, CYCLES, DILUTION, ELECTROCHEMISTRY, ELECTRON ENERGY, ELECTRON SPECTROSCOPY, HORIZONTAL ORIENTATION, LAYERS, LOSSES, NICOTINIC ACID, ORIENTATION(DIRECTION), OXIDATION REDUCTION REACTIONS, PHENOLS, PLATINUM, PURITY, SOLUTIONS(MIXTURES), MOLECULAR STRUCTURE, SUBSTRATES, SULFUR, SURFACES, TILT, VERTICAL ORIENTATION, WATER, ELECTROCATALYSTS, SURFACE REACTIONS, POLYCRYSTALLINE.

PERSONAL AUTHORS: Van Wazer, John R.; Ewig, Carl S.; Ditchfield, Robert

CONTRACT NO. AFOSR-86-0146

PROJECT NO. 2303

TASK NO. 83

MONITOR: AFOSR  
TR-89-0926

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in The Jnl. of Physical Chemistry, v93 n8 p2222-2230 1989.

ABSTRACT: (U) Silicon 29 Nuclear Magnetic Resonance shielding tensors (and the chemical shifts derived therefrom) were calculated for 28 representative silicon compounds, employing optimized molecular structures and a split-valence contracted basis set in a gauge-invariant representation. The following substituted-substituents series of compounds were investigated: SiH4/SiF4, SiH4/Si(CH3)4, Si(CH3)4/SiF4, and part of two series involving the SiC14 molecule. Within these series and within a group of silyl derivatives, the calculated and experimental chemical-shift data agreed quite well a group of disilicon compounds H3Si-X-SiH3 were also studied, as well as the SiF8 (2-) anion. The paramagnetic and diamagnetic contributions to the magnetic shielding were analyzed, and a relationship between the paramagnetic term and the electron-withdrawing power of the substituents on the silicon was found. Keywords: Silanes, Fluorosilanes, Methyl silane, Reprints. (AW)

DESCRIPTORS: (U) \*CHEMICAL SHIFTS, \*SILANES, \*NUCLEAR MAGNETIC RESONANCE, MAGNETIC FIELDS, METHYL RADICALS, MOLECULAR STRUCTURE, OPTIMIZATION, REPRINTS, SHIELDING, SILICON, SILICON COMPOUNDS, FLUORINE COMPOUNDS, CHLORINE

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COMPOUNDS.

NEW YORK UNIV NY COURANT INST OF MATHEMATICAL SCIENCES

IDENTIFIERS: (U) PEG1102F, WUAFOSR230383, Fluorosilanes,  
Chlorosilanes, Silyl Radicals.

(U) Automatic Construction of Polyhedral Surfaces from  
Voxel Representations.

DESCRIPTIVE NOTE: Technical rept.,

JUN 89

PERSONAL AUTHORS: Schwartz, Eric L.; Shaw, Alan

REPORT NO. TR-381, RR-158

CONTRACT NO. AFOSR-85-0341

PROJECT NO. 2313

TASK NO. A5

MONITOR: AFOSR  
TR-89-0978

UNCLASSIFIED REPORT

ABSTRACT: (U) Various applications require triangulations, or polyhedral representations, of surfaces which are represented as serial sections. Heuristic methods are in common use to triangulate such data. These methods work well on segments of generalized cylinder, i.e., runs of sections containing single loops, but they often fail when attempting to process highly convoluted surfaces. This is because the topology of the sections changes when a critical point of the surface is encountered. This paper uses the equivalent of the full adjacency graph of the surface, provided by a voxel model, to classify the changes in topology of the sections of the surface, and thereby guide the triangulation process. For a voxel surface which is a discrete sampling of a smooth manifold in general position, we are able to exhaustively classify the small set of possible topological changes in the sections of the surface, we then deal with these cases exhaustively. To the best of our knowledge, this is the first description of an algorithm which can in theory and practice triangulate surfaces as complex as that of a brain. From serial sections, without human interaction. Keywords: Computer graphs; Computer aided design; Numerical analysis; Biomedical applications. (KR)

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NEW YORK UNIV NY COURANT INST OF MATHEMATICAL SCIENCES

DESCRIPTORS: (U) \*ALGORITHMS, \*TRIANGULATION, AUTOMATIC, BIOMEDICINE, BRAIN, COMPUTER AIDED DESIGN, COMPUTERS, CONSTRUCTION, GRAPHS, HEURISTIC METHODS, HUMANS, INTERACTIONS, LOOPS, NUMERICAL ANALYSIS, POSITION(LOCATION), SAMPLING, SURFACES, TOPOLOGY.

(U) A New Method for Measuring the Visuotopic Map Function of Striate Cortex: Validation with Macaque Data and Possible Extension to Measurement of the Human Map.

DESCRIPTIVE NOTE: Technical rept.,

87

IDENTIFIERS: (U) PE81102F, WUAFOSR2313A5, \*Polyhedral Surfaces.

PERSONAL AUTHORS: Schwartz, Eric

CONTRACT NO. AFOSR-85-0341

PROJECT NO. 2313

TASK NO. A5

MONITOR: AFOSR  
TR-89-0977

UNCLASSIFIED REPORT

ABSTRACT: (U) The observation and measurement of the visuotopic map of primate visual cortex is a classical experimental activity. A number of psychophysical (e.g. vernier acuity, visual acuity, Panum's area stereo acuity, motion thresholds) and anatomical (e.g. retinal cell densities) measurements bear at least a qualitative relationship to the presumed curve of cortical magnification. However, there is no accurate and direct method for estimating human magnification factor; and even for the case of monkeys, where micro-electrode and 2DG experiments have been performed, there is still uncertainty in this area. What is the correct functional form for the primate map? What is the variance of this estimate across a population? In order to address these issues, we have constructed a computer generated planar approximation to the surface of Macaque striate cortex (median flattening error = 5%). Other topics in this report include: Flattening Visual Cortex at Image Resolution; Quantitative Computer Reconstruction of the Macaque Ocular Dominance Column Pattern; Image Simulation of the Macaque Ocular Dominance Column System; Three Dimensional Computer Reconstruction of the Ocular Dominance Column Pattern of Macaque Striate Cortex. Demonstrating a Digital Tangential Microtome, frequency Specificity and Inhibitory Interactions for fourier

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Descriptors of Boundary Curvature; Image Processing  
Simulations of the Functional Architecture of Primate  
Striate Cortex. (AW)

WISCONSIN UNIV-MADISON SCHOOL OF PHARMACY

(U) Perfluorodecanoic Acid and Lipid Metabolism in the Rat

DESCRIPTORS: (U) \*IMAGE PROCESSING, \*VISUAL CORTEX,  
\*COMPUTER APPLICATIONS, \*MAPPING, \*COMPUTER GRAPHICS,  
ACCURACY, ACUITY, ARCHITECTURE, BOUNDARIES, CELL(S) BIOLOGY,  
COMPUTERS, CURVATURE, DENSITY, EYE, FOURIER ANALYSIS,  
FUNCTIONS, HUMAN FACTORS ENGINEERING, HUMANS, IMAGES,  
INDEX TERMS, INHIBITION, INTERACTIONS, MACAQUE MONKEYS,  
MAGNIFICATION, MAPS, MONKEYS, PATTERNS, POPULATION,  
PRIMATES, RESOLUTION, RETINA, COMPUTERIZED SIMULATION,  
VALIDATION, VISUAL ACUITY, PSYCHOPHYSICS.

IDENTIFIERS: (U) \*Striate Cortex, \*Visuotopic Maps,  
Computer Generated Planar Approximation, Flattening,  
Computer Reconstruction, Ocular Dominance, Brain  
Architecture.

DESCRIPTIVE NOTE: Annual rept. Jun 88-Jun 89,

MAY 89

PERSONAL AUTHORS: Van Rafelghem, Marc J.; Heuvel, John P.;  
Menahan, Lawrence A.; Peterson, Richard E.

CONTRACT NO. AFOSR-85-0207

PROJECT NO. 2312

TASK NO. A5

MONITOR: AFOSR  
TR-89-0923

UNCLASSIFIED REPORT

ABSTRACT: (U) Derivatives of perfluorosulfonic and  
perfluorocarboxylic acids have been used in a number of  
industrial applications as lubricants, plasticizers,  
writing agents and corrosion inhibitors. Aqueous film-  
forming foams, used as fire extinguishants, contain  
mixtures of hydrocarbon and fluorocarbon surfactants  
(derivatized fatty acids) due to their superior surface-  
active properties. Studies on the effects of  
perfluorodecanoic acid (PFDA) on lipid metabolism in the  
rat after a single intraperitoneal dose (20, 40, 80 mg/kg)  
were completed. Because PFDA treatment causes a dose-  
related reduction in feed intake, the response of vehicle  
treated rats pair-fed to those receiving PFDA was  
monitored to distinguish direct effects of the  
perfluorinated fatty acid from those secondary to  
hypophagia. A reduction in the carcass content of lipid  
phosphorus (phospholipid) and free cholesterol in rats  
treated with PFDA appeared to be consequent to hypophagia,  
as the pair fed animals exhibited the same attenuation  
PFDA-treated rats were found to have a higher  
concentrations of triacylglycerols than their vehicle  
treated, pair-fed counterparts. It appears PFDA treatment  
results in the diversion of fatty acids from oxidations  
towards esterification in the liver. Reprints. (kt)

DESCRIPTORS: (U) \*SULFONIC ACIDS, \*LIPID METABOLISM.

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ACIDS, ATTENUATION, CHEMICAL REACTIONS, CHOLESTEROL, CARBOXYLIC ACIDS, PHYSIOLOGICAL EFFECTS, RESPONSE(BIOLOGY), GLYCEROLS, ESTERS, FATTY ACIDS, FILMS, FIRE EXTINGUISHING AGENTS, FLUORINATED HYDROCARBONS, FLUORINATION, FOAM, HYDROCARBONS, INDUSTRIES, LIPIDS, LIQUIDS, LIVER, LUBRICANTS, MIXTURES, PHOSPHOLIPIDS, PHOSPHORUS, PLASTICIZERS, RATS, REPRINTS, SURFACE ACTIVE SUBSTANCES, WRITING.

NEW YORK UNIV N Y

(U) Visualizing and Rhyming Cause Differences in Alpha Suppression.

DESCRIPTIVE NOTE: Rept. for 1 Mar 88-28 Feb 89.

MAY 89

IDENTIFIERS: (U) PEG1102F, WUAFOSR2312A5, \*Perfluorodecanoic Acids, Triaxylglycerols.

PERSONAL AUTHORS: Kaufman, Lloyd

CONTRACT NO. F49620-88-K-0004

PROJECT NO. 2313

TASK NO. A4

MONITOR: AFOSR  
TR-89-0962

UNCLASSIFIED REPORT

ABSTRACT: (U) Alpha rhythms of the EEG are strongest at the occipital regions of the head, and the visual cortex is apparently a major contributor. It has been suggested that visual cortex is involved in forming and processing mental images. The purpose of this experiment is to determine if a task that involves visualizing objects represented by words produces changes in alpha rhythms of the MEG that differ from changes associated with finding rhymes of the same or related verbal stimuli. By hypothesis, the visual areas of the cortex play a less prominent role in the latter task than they do in the visualizing task. This inference is consistent with the finding that visual imagery is accompanied by attenuation of the alpha rhythm over the occipital scalp, in the proximity of visual cortex cognitive factors, such as memorization and classification of words, affects the pattern of alpha blockage across the occipital and parietal area, but this does not establish that visual cortex per se is involved. Subjects responded by forming mental images of the objects represented by the words. The event related potentials associated with presentation of the words were larger in amplitude than they were when the subjects silently pronounced words that rhymed with the stimuli instead of forming mental images. This effect was more evident at occipital electrodes than it was at other locations. There may well be differential

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suppression of alpha activity depending on the degree to which visual resources are engaged in various mental tasks, such as imaging. Keywords: Brain; Brain function; Neurochemistry. Reprints. (kt)

NATIONAL ACADEMY OF SCIENCES-NATIONAL RESEARCH COUNCIL WASHINGTON DC

(U) Support of Travel for U.S. Participants in 5th International Biophysics Congress (5th) Held in Copenhagen, Denmark 4-9 August 1975.

DESCRIPTORS: (U) \*BIOLOGICAL RHYTHMS, \*COGNITION, \*NEUROCHEMISTRY, \*VISUAL CORTEX, ATTENUATION, BRAIN, CLASSIFICATION, ELECTROENCEPHALOGRAPHY, FUNCTIONS, HYPOTHESES, IMAGES, MENTAL ABILITY, OPTICAL IMAGES, PROCESSING, REPRINTS, RESOURCES, STIMULI, SUPPRESSION, VERBAL BEHAVIOR, WORDS(LANGUAGE).

DESCRIPTIVE NOTE: Final rept.,

JAN 76

PERSONAL AUTHORS: Sheppard, Harvey E.

IDENTIFIERS: (U) PE61102F, WUAFOSR2313A4, \*Alpha Rhythms, Brain Function, Brain Waves.

CONTRACT NO. AFOSR-75-2838

PROJECT NO. 9777

MONITOR: AFOSR  
TR-89-0864

UNCLASSIFIED REPORT

ABSTRACT: (U) This document consist of partial support of travel by five scientists to the 5th International Biophysics Congress, Copenhagen, which was covered under this grant in addition to administrative costs. Applications were screened by a Committee of the Assembly of Life Sciences, National Research Council. Report by the official U.S. delegation to the congress and informal reports by the attendees are attached. (kt)

DESCRIPTORS: (U) \*MANAGEMENT, \*TRAVEL, ADDITION, COSTS, LIFE SCIENCES, INTERNATIONAL, BIOPHYSICS.

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NATIONAL BUREAU OF STANDARDS WASHINGTON DC MOLECULAR SPECTROSCOPY DIV

UNIVERSITY OF SOUTHERN CALIFORNIA LOS ANGELES CENTER FOR LASER STUDIES

(U) Unimolecular Dynamics Following Vibrational Overtone Excitation of  $\text{HN}_3$   $\nu_1=5$  and  $\nu_1=6$ :  $\text{HN}_3(\text{X}, \text{v}, \text{J}, \text{K})$  Yields  $\text{HN}(\text{X}(3)\text{Sigma}^-(\text{vJOmega})+\text{N}_2(\text{X}(1)\text{Sigma}^+g))$ .

(U) New, Efficient Optically Pumped Solid State Lasers.

DESCRIPTIVE NOTE: Final rept. 15 Aug 84-14 Nov 88.

JUL 88

FEB 89

PERSONAL AUTHORS: Foy, B. R.; Casassa, M. P.; Stephenson, J. C.; King, D. S.

PERSONAL AUTHORS: Bass, Michael; Birnbaum, Milton

PROJECT NO. 2303

CONTRACT NO. AFOSR-84-0378

TASK NO. B1

PROJECT NO. 2301

MONITOR: AFOSR

TR-89-0429

MONITOR: AFOSR

TR-89-0919

UNCLASSIFIED REPORT

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Jnl. of Chemical Physics, v89 n1 p608-609, 1 Jul 88.

ABSTRACT: (U) We report measurements of the unimolecular vibrational predissociation lifetimes and  $\text{NH}(\text{X } 3 \text{ sigma}^-)$  product state distributions following excitation of the fourth and fifth  $\text{NH}$ -stretching overtone transitions of  $\text{HN}_3$ . These state-to-state photodissociation experiments provide and exceptionally detailed view of the dynamics of vibrationally excited  $\text{HN}_3$  and complement high resolution spectra and linewidth data for assigned rovibrational levels of  $\nu_1 = 4, 5, \text{ and } 6$ . Reprints. (AW)

DESCRIPTORS: (U) \*PHOTODISSOCIATION, \*MOLECULAR VIBRATION, \*HYDRAZOIC ACID, DYNAMICS, MEASUREMENT, REPORTS, REPRINTS, ELECTRON TRANSITIONS, MOLECULAR ROTATION, MOLECULAR ENERGY LEVELS, EXCITATION, VIBRATIONAL SPECTRA.

ABSTRACT: (U) This effort explored the effects on laser operation of ion-ion interactions in crystalline solids. Our work on the doubly-doubly Nd, Er, YAG and Nd, Ho: YAG lasers has demonstrated not only simultaneous lasing of both ionic species but also drastic lifetime productions in the lower laser states of both Er and Ho. This work has enabled us to predict crystals in which 4 level operations at 2.9 microns can be achieved and initial verification was obtained with Er,Nd: YALO. Keywords: Solid state lasers; Laser spectroscopy; Ion-ion interactions. (jhd)

DESCRIPTORS: (U) \*SOLID STATE LASERS, CRYSTALS, ION ION INTERACTION, EFFICIENCY, OPTICAL PUMPING, DOPING, OPERATION, SOLIDS, SPECTROSCOPY, ERBIUM, HOLMIUM, YAG LASERS, YTTRIUM ALUMINUM GARNET, NEODYMIUM.

IDENTIFIERS: (U) Laser Spectroscopy, WUAFOSR2301A1, PEG1102F.

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## DTIC REPORT BIBLIOGRAPHY

SEARCH CONTROL NO. EVI09K

AD-A209 997

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AD-A209 996

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CALIFORNIA UNIV DAVIS DEPT OF MECHANICAL ENGINEERING

NORTH CAROLINA UNIV AT CHAPEL HILL DEPT OF STATISTICS

(U) Superplasticity - A Fundamental Investigation on Deformation Mechanism and Cavitation Phenomena.

(U) Statistical Communication Theory and Robust Estimation.

DESCRIPTIVE NOTE: Final rept. 1 Feb 86-31 Jan 89,

DESCRIPTIVE NOTE: Final rept.,

JUN 80

JAN 80

PERSONAL AUTHORS: Mukherjee, A. K.; Bieler, T. R.

PERSONAL AUTHORS: Cambanis, S.; Carroll, R. J.

CONTRACT NO. AFOSR-88-0091

CONTRACT NO. AFOSR-75-2796

PROJECT NO. 2306

PROJECT NO. 2304

TASK NO. A1

TASK NO. A5

MONITOR: AFOSR

MONITOR: AFOSR

TR-89-0912

TR-89-0853

## UNCLASSIFIED REPORT

## UNCLASSIFIED REPORT

ABSTRACT: (U) Superplasticity at high strain rates was obtained in mechanically alloyed aluminum IN90211. The high rate was due to the fine grain size. A threshold stress analysis, combined with SEM and TEM observations permitted the deformation mechanisms to be determined. Very little cavitation was observed, due to the grain morphology, and the deformation mechanisms that are operative. Superplasticity, Mechanical behavior, Deformation mechanisms, Cavitation phenomenon, Adiabatic heating, Threshold stresses, Dispersion strengthening. (jes)

DESCRIPTORS: (U) \*CAVITATION, \*SUPERPLASTICITY, ADIABATIC CONDITIONS, DEFORMATION, DISPERSION HARDENING, FINE GRAINED MATERIALS, GRAIN SIZE, GRAIN STRUCTURES(METALLURGY), HEATING, HIGH RATE, MECHANICAL PROPERTIES, MORPHOLOGY, STRAIN RATE, STRENGTH(MECHANICS), STRESS ANALYSIS, STRESSES, THRESHOLD EFFECTS.

IDENTIFIERS: (U) WUAFOSR2306A1, PE61102F.

ABSTRACT: (U) Research completed includes consistent estimation of (nonrandom) signals from nonlinear transformations of noisy samples; approximations of non-bandlimited signals using a finite number of samples and their rate of convergence; (infinite) sampling approximations for non-bandlimited signals, and sampling representations for bounded linear operations on bandlimited signals, and for generalized bandlimited signals; the evaluation of linear estimates and regression estimates in stable processes, including regression and linear filtering of signals in noise; and certain probability and expectation inequalities. Research completed includes work in the following areas: trimming least squares estimators in the linear model by using a preliminary estimator; tests for heteroscedasticity in the linear model; estimation of regression coefficients in a heteroscedastic linear model; almost sure properties of robust regression estimates with applications to sequential clinical trials; robust methods in factorial experiments; studying sequential procedures for estimating the largest of three normal means; nonparametric estimation of regression functions. (RH)

DESCRIPTORS: (U) \*APPROXIMATION(MATHEMATICS), \*COMBINATORIAL ANALYSIS, \*ESTIMATES, \*INFORMATION THEORY, \*LINEAR FILTERING, \*MATHEMATICAL MODELS, \*NONLINEAR

DESCRIPTORS: (U) \*APPROXIMATION(MATHEMATICS),

\*COMBINATORIAL ANALYSIS, \*ESTIMATES, \*INFORMATION THEORY, \*LINEAR FILTERING, \*MATHEMATICAL MODELS, \*NONLINEAR

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SYSTEMS, \*SEQUENTIAL ANALYSIS, BANDWIDTH, COEFFICIENTS, CONSISTENCY, CONVERGENCE, FUNCTIONS, LIMITATIONS, LINEAR SYSTEMS, LINEARITY, NONPARAMETRIC STATISTICS, OPERATION, RATES, REGRESSION ANALYSIS, SAMPLING, SIGNALS, STABILITY, STATISTICS, TRANSFORMATIONS.

WISCONSIN UNIV-MADISON

(U) Some Problems in Nonlinear Analysis.

DESCRIPTIVE NOTE: Final rept. 1 Jun 87-31 Jan 89.

IDENTIFIERS: (U) WUAFOSR2304A5, PE61102F.

89

PERSONAL AUTHORS: Crandall, Michael G.

CONTRACT NO. AFOSR-87-0202

PROJECT NO. 2304

TASK NO. A9

MONITOR: AFOSR  
TR-89-0918

UNCLASSIFIED REPORT

ABSTRACT: (U) A program for obtaining the basic results of Kato's theory of quasilinear evolution equations was obtained by the simpler methods of nonlinear semigroup theory (implicit differencing in time). Certain classes of parabolic and Hamilton-Jacobi equations show the existence and uniqueness of solutions if initial boundary value problems with singular (e.g., identically infinite) initial data and the continuous dependence of these singular solutions as the diffusion coefficient tends to zero. This work shows how certain pde questions motivated by the theory of large deviations can be treated in greater generality and provides a certain abstract framework for this as well as concrete estimates. (jhd)

DESCRIPTORS: (U) \*GROUPS(MATHEMATICS), \*NONLINEAR ANALYSIS, BOUNDARY VALUE PROBLEMS, DIFFUSION COEFFICIENT, EQUATIONS, ESTIMATES, EVOLUTION(GENERAL), SOLUTIONS(GENERAL).

IDENTIFIERS: (U) Kato Theory, Quasilinear Evolution Equations, WUAFOSR2304A9, PE61102F.

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AD-A209 989 CONTINUED

TEXAS UNIV AT AUSTIN ELECTRONICS RESEARCH CENTER

(U) Electronics Research at the University of Texas at Austin.

DESCRIPTIVE NOTE: Final rept. 1 Apr 86-31 Mar 89.

MAY 89

PERSONAL AUTHORS: Powers, Edward J.

REPORT NO. TR-39

CONTRACT NO. F49620-86-C-0045

PROJECT NO. 2305

TASK NO. A9

MONITOR: AFOSR  
TR-89-0800

UNCLASSIFIED REPORT

ABSTRACT: (U) This final report covers the period from April 1, 1986 through March 31, 1989. The progress reported concerns research conducted by ten faculty members and approximately thirty graduate students from the Department of Electrical and Computer Engineering and the Department of Physics. The University of Texas DoD JSEP program is a broad-based program with four research units in Solid State Electronics, two in Electromagnetics, two in Quantum Electronics, and two in Information Electronics. Solid State Electronics includes work on implantation and annealing of InP and related compounds; applications; epitaxial growth, structure and electronic properties of silicones on silicon surfaces; and femtosecond processes in condensed matter. In Quantum Electronics, nonlinear optical interactions and nonlinear Raman scattering from molecular ions have been investigated. Work in Electromagnetics includes millimeter-wave monolithic array components and nonlinear wave phenomena. While electronic signal processing and nonlinear estimation and detection have been studied in Information Electronics. (rh)

DESCRIPTORS: (U) \*ELECTRICAL EQUIPMENT, \*ELECTRONIC

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EQUIPMENT, \*ELECTRONICS, \*MONOLITHIC STRUCTURES(ELECTRONICS), \*SOLID STATE ELECTRONICS, ANNEALING, ARRAYS, COMPUTERS, DETECTION, ENGINEERING, EPITAXIAL GROWTH, ESTIMATES, IMPLANTATION, INSTRUCTORS, INTERACTIONS, LIGHT SCATTERING, MILLIMETER WAVES, MOLECULAR BEAMS, MOLECULAR IONS, NONLINEAR ANALYSIS, NONLINEAR SYSTEMS, OPTICAL PROPERTIES, PHYSICS, PROCESSING, QUANTUM ELECTRONICS, RAMAN SPECTRA, SIGNAL WAVES, SILICIDES, SILICON, STUDENTS, SURFACES, TEXAS, WAVES.

IDENTIFIERS: (U) WUAFOSR2305A9, PE61102F.

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DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVIO9K

AD-A209 985 6/4 12/5

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NEW YORK UNIV N Y

(AW)

(U) Applications of Computer Graphics and Image Processing to 2D and 3D Modeling of the Functional Architecture of Visual Cortex.

DESCRIPTIVE NOTE: Technical rept.,

JUL 88

PERSONAL AUTHORS: Schwartz, Eric L.

CONTRACT NO. AFOSR-85-0341

PROJECT NO. 2313

TASK NO. A5

MONITOR: AFOSR  
TR-89-0976

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in IEEE Computer Graphics and Applications, Computational Neuroscience 13, p12-23 Jul 88.

ABSTRACT: (U) The visual cortex of monkeys is one of the most extensive studied areas of the primate brain. Nearly half of monkey cortex is devoted to visual processing, and the twenty-odd functional areas that make up visual cortex represent, arguably, one of the most complex mechanisms in nature. Attempts at understanding visual cortex pose a wide range of problems in computer graphics, image processing, computational geometry, and numerical methods. The term computational neuroscience has recently come into use to describe this area of study. In this article we describe a series of studies in this area of work which illustrate a number of applications of computer graphics and image processing to the reconstruction and representation of the complex architectures that make up primate visual cortex. We demonstrate techniques for reconstructing brains in three dimensions, peeling them apart, and flattening the brain with minimal metric error. Finally, we show simulations of natural images as they are mapped in the brain by these architectures, including a simulation of a stereo image at the level of primary visual cortex. Reprints.

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D CRIPTORS: (U) \*COMPUTER GRAPHICS, \*IMAGE PROCESSING, \*VISUAL CORTEX, ARCHITECTURE, BRAIN, COMPUTATIONS, ERRORS, GEOMETRY, IMAGES, MONKEYS, NUMERICAL METHODS AND PROCEDURES, PRIMATES, RANGE (EXTREMES), REPRINTS, COMPUTERIZED SIMULATION, STEREOSCOPIC DISPLAY SYSTEMS, VISUAL PERCEPTION, MATHEMATICAL MODELS, ANATOMICAL MODELS, TWJ DIMENSIONAL, THREE DIMENSIONAL.

IDENTIFIERS: (U) PEG1102F, WUAFOSR2313A5, \*Computational Neuroscience, Brain Architecture.

UNCLASSIFIED

UTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EV109K

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AD-A209 984 CONTINUED

NEW YORK UNIV NY COURANT INST OF MATHEMATICAL SCIENCES

\*HUMANS, \*SCANNING, \*VISION, BIOLOGY, BOUNDARIES, CURVATURE, SHAPE, SPACE ENVIRONMENTS, VARIATIONS.

(U) Shape Description with a Space Variant Sensor:  
Algorithms for Scan-Path, Fusion and Convergence Over Multiple Scans.

IDENTIFIERS: (U) PE61102F, WUAFOSR2313A5.

DESCRIPTIVE NOTE: Technical rept..

APR 87

PERSONAL AUTHORS: Yeshurun, Yehezkel; Schwartz, Eric L.

REPORT NO. TR-295, RR-109

CONTRACT NO. AFOSR-85-0341

PROJECT NO. 2313

TASK NO. A5

MONITOR: AFOSR  
TR-89-0975

UNCLASSIFIED REPORT

ABSTRACT: (U) One of the ways by which early human vision is sharply distinguished from machine vision is by the fact that the human visual representation is strongly space variant and that the human system builds up a representation of a scene through multiple fixations during scanning. In this paper, we discuss three algorithms related to the 'blending' of a single scene from multiple frames acquired from a space variant sensor. 1) Given a series of space-variant contour based scenes, with different 'fixation points', we show how to fuse these into a single, multi-scan view, which incorporates the information present in the individual scans. 2) We demonstrate an (attentional) algorithm which recursively examines the current knowledge of the scene, in order to best choose the next fixation point, based on focusing attention in regions of maximum boundary curvature. 3) We discuss a simple metric for evaluating 'convergence' over scan-path. This may be used to quantify the performance of (2) above, i.e. to compare the performance of various 'attentional' algorithms. Finally, we discuss this work in the light of both machine and biological vision. (RH)

DESCRIPTORS: (U) \*ALGORITHMS, \*DETECTORS, \*FRAMES,

AD-A209 984

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AD-A209 983 7/4 20/5 DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVI09K  
AD-A209 983 CONTINUED

UNITED TECHNOLOGIES RESEARCH CENTER EAST HARTFORD CT

(U) He<sub>2</sub>-(4II sub g) Yields He<sub>2</sub>(X1 Sigma+) Autodetachment  
Energy Spectrum: Assessment of the He<sub>2</sub> - and He<sub>2</sub>  
Ground-State Potentials.

IDENTIFIERS: (U) PE61102F, WUAFOSR2301A7.

DR 88

PERSONAL AUTHORS: Bae, Y. K.; Peterson, J. R.; Michels, H.  
H.; Hobbs, R. H.

CONTRACT NO. F49620-85-C-0095

PROJECT NO. 2301

TASK NO. A7

MONITOR: AFOSR  
TR-89-0814

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Physical Review A, v37 n8  
p2778-2784, 15 Apr 88.

ABSTRACT: (U) The energy from the spin-forbidden  
electronic autodetachment from the metastable He<sub>2</sub>-4 P<sub>ig</sub>  
ion has been measured. The single-peaked continuum,  
resulting from a vertical transition to the repulsive  
well of the He<sub>2</sub>X 1sigma + ground state, has a maximum at  
15.70 + or - 0.15 eV. For a rotationally cool beam, the  
spectrum is inconsistent with the existing potentials of  
He<sub>2</sub>- and He<sub>2</sub>X sigma +. A suitable fit, neglecting  
rotational effects, would require an increase of 0.06 A2  
in the calculated Re of He<sub>2</sub>-. However a very good fit can  
also be obtained from the existing potentials by assuming  
a rotationally hot (15 000 K) distribution. Surprisingly,  
both fits require contributions from levels v > 0, which  
are known to undergo vibrational autodetachment to He<sub>2</sub>A 3  
SIGMA U +. For such contributions, the latter process  
must be exceptionally slow (10 to the 6th power/s).  
Reprints. (AW)

DESCRIPTORS: (U) \*HELIUM, \*MOLECULAR ROTATION,  
\*MOLECULAR VIBRATION, \*GROUND STATE, COOLING, ENERGY,  
REPRINTS, ROTATION, SPECTRA, TRANSITIONS, VERTICAL  
ORIENTATION, ELECTRONIC STATES, METASTABLE STATE, IONS,  
POTENTIAL ENERGY.

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AD-A209 982 12/9 6/4

NEW YORK UNIV NY COURANT INST OF MATHEMATICAL SCIENCES

(U) Towards a Non-Network Approach to Neural Modeling:  
Some Basic Issues of Measurement, Simulation and  
Computational Significance of Brain Maps.

JUN 87

PERSONAL AUTHORS: Schwartz, Eric L.; Yeshurun, Yehezkel

CONTRACT NO. AFOSR-85-0341

PROJECT NO. 2313

TASK NO. A5

MONITOR: AFOSR  
TR-89-0968

UNCLASSIFIED REPORT

Pub. in IEEE Annual International Conference on Neural  
Networks (1st) pIV-225-IV-233 Jun 87.

ABSTRACT: (U) The term neural network is often associated with the construction of networks of schematic neurons to implement functions such as associative memory, classification, visual segmentation, etc. One advantage of this approach to modeling the nervous system is its explicit computational power: neural models are set up with the exclusive goal of solving a particular computational problem. One disadvantage of this approach is its remoteness from the actual data of the nervous system. The details of complex neural networks are very difficult to observe. The experimental likelihood of such observation, or even of experimental constraint on current network models, is not favorable in the near future. This work provides a non-network approach to neural modeling in the following sense: we model brain architecture and computation at a continuum, rather than a discrete, or neuronal, level of scale. From a practical point of view, this allows us to simulate biological processing of early vision using conventional image processing techniques (e.g. convolution), avoiding the largely unknown details of network level implementation. In doing so, a concept of the cortical component of the brain as a map machine emerges. This is, novel architectures which have been observed over the past few

decades may have computational significance, and may represent an alternative approach to the theory of neural computation which stresses the aspect of data structure over the details of network implementation. (KR)

DESCRIPTORS: (U) \*BRAIN, \*MAPS, \*ANATOMICAL MODELS, ARCHITECTURE, ASSOCIATIVE PROCESSING, BIOLOGY, COMPUTATIONS, DATA BASES, IMAGE PROCESSING, METHODOLOGY, NERVE CELLS, NERVOUS SYSTEM, NETWORKS, NEURAL NETS, OPTICAL IMAGES, POWER, PROCESSING, SCALE, SCHEMATIC DIAGRAMS, SEGMENTED, SIMULATION, STRESSES, VISION.

IDENTIFIERS: (U) PEG1102F, WUAFOSR2313A5.

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AD-A209 942 20/9 9/1 AD-A209 942 CONTINUED

APPLIED MICROWAVE PLASMA CONCEPTS CARLSBAD CA

(U) A Two-Stream Plasma Electron Microwave Source for High-Power Millimeter Wave Generation. Phase 1.

DESCRIPTIVE NOTE: Final rept. 1 Aug 88-31 Jan 89.

MAR 89

PERSONAL AUTHORS: Guest, Gareth E.; Dandl, Raphael A.

REPORT NO. AMPC-033-038

CONTRACT NO. F49620-88-C-0101

PROJECT NO. 2301

TASK NO. A8

MONITOR: AFOSR  
TR-89-0840

UNCLASSIFIED REPORT

ABSTRACT: (U) A novel high power millimeter/microwave source is proposed in which one or more pairs of interpenetrating streams of electrons flowing through a background plasma in a static magnetic field are used to generate a hot-electron plasma that is confined in a mirror-like magnetic field. Energy stored in the anisotropic, hot-electron plasma is then used to amplify pulses of unstable plasma waves to large amplitude by selective deactivation of mechanisms that stabilize the hot-electron plasma during the energy accumulation phase when the density of hot electrons is rapidly increased through the beam-plasma interaction. The Phase I program has yielded a design for an experimental arrangement capable of verifying the key aspects of this novel source concept, as well as a theoretical framework for interpreting the empirical Phase II results produced by the experimental device and extrapolating those results to evaluate the suitability of the proposed source to meet the requirements of various high power microwave and millimeter wave defense and industrial applications. The experiments will be carried out in a timely and cost-effective way by employing the AMPHD experimental facility at AMPC. (UHD)

DESCRIPTORS: (U) \*RADIOFREQUENCY GENERATORS, \*MICROWAVE EQUIPMENT, \*MILLIMETER WAVES, ACCUMULATION, AMPLITUDE, BEAMS(RADIATION), COST EFFECTIVENESS, DEFENSE SYSTEMS, ELECTRON DENSITY, ENERGY, HIGH POWER, INTERACTIONS, RADIOFREQUENCY AMPLIFIERS, MAGNETIC FIELDS, PLASMA WAVES, PLASMA DEVICES, PLASMAS(PHYSICS), RADIOFREQUENCY POWER, SOURCES, TIMELINESS, WAVE PROPAGATION.

IDENTIFIERS: (U) High Power Microwaves, PE61102F, WUAFOSR2301A8.

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AD-A209 936 20/8 12/6 9/5  
UNIVERSITY OF SOUTHERN CALIFORNIA LOS ANGELES  
(U) Integrated Opto-Electronic Computing.  
DESCRIPTIVE NOTE: Final technical rept. 1 Jul 88-31 Jan 89.  
APR 89

PERSONAL AUTHORS: Steler, W. H.; Savchuk, A. A.  
REPORT NO. 53-4502-0337  
CONTRACT NO. AFOSR-88-0211  
PROJECT NO. 2305  
TASK NO. B4  
MONITOR: AFOSR  
TR-89-0910

## UNCLASSIFIED REPORT

ABSTRACT: (U) Research assistants supported by this grant have worked in a variety of optical computing projects. These projects are summarized briefly in this report. Keywords: Optical interconnection networks; Integrated optoelectronic transceivers; Laser arrays; Array receivers; Optical processors image understanding. (RH)

DESCRIPTORS: (U) \*CIRCUIT INTERCONNECTIONS, \*COMPUTATIONS, \*ELECTROOPTICS, \*INTEGRATED SYSTEMS, \*OPTICAL PROCESSING, \*TRANSMITTER RECEIVERS, ARRAYS, LASERS, NETWORKS, OPTICAL IMAGES, OPTICAL PROPERTIES, RECEIVERS.

IDENTIFIERS: (U) PEG1102F, WUAFOSR2305B4.

SEARCH CONTROL NO. EVIO9K

AD-A209 935 12/3

NORTH CAROLINA UNIV AT CHAPEL HILL DEPT OF STATISTICS

(U) Research in Stochastic Processes.  
DESCRIPTIVE NOTE: Final rept. 1 Sep 87-31 Aug 88.

AUG 88

PERSONAL AUTHORS: Cambanis, Stamatis; Carroll, Raymond J.; Kallianpur, Gopinath; Leadbetter, M. R.

CONTRACT NO. F49620-85-C-0144

PROJECT NO. 2304

TASK NO. A5

MONITOR: AFOSR  
TR-89-0913

## UNCLASSIFIED REPORT

ABSTRACT: (U) Research was conducted and directed in the area of stochastic processes by three of the principal investigators, S. Cambanis, G. Kallianpur and M. R. Leadbetter, and their associates, and in statistical inference by R. J. Carroll. A summary of the main areas of research activity follows for each Principal Investigator and co-workers. More detailed descriptions of the work of all participants is given in the main body of the report. Keywords: Signal processing, Nonlinear filters, Stationary, Weighted least square. (KR)

DESCRIPTORS: (U) \*STOCHASTIC PROCESSES, FILTERS, LEAST SQUARES METHOD, NONLINEAR SYSTEMS, SIGNAL PROCESSING, STATIONARY, STATISTICAL INFERENCE, WEIGHTING FUNCTIONS.  
IDENTIFIERS: (U) PEG1102F, WUAFOSR2304A5.

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AD-A209 934 CONTINUED

AD-A209 934 11/6.2 11/6.1 LOCKHEED MISSILES AND SPACE CO INC PALO ALTO CA RESEARCH AND DEVELOPMENT DIV

(U) Effect of Alloying, Rapid Solidification, and Surface Kinetics on the High Temperature Environmental Resistance of Niobium.

DESCRIPTIVE NOTE: Technical rept. Nov 85-Jan 89.

JUN 89

PERSONAL AUTHORS: Perkins, R. A.; Chiang, K. T.; Meier, G. H.; Miller, R. A.

REPORT NO. LMSC-F352227

CONTRACT NO. F49620-86-C-0018

PROJECT NO. 2306

TASK NO. A1

MONITOR: AFOSR  
TR-89-0909

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Prepared in cooperation with Pittsburgh Univ., PA.

ABSTRACT: (U) Factors affecting the formation of protective alumina scales on niobium-base alloys by selective oxidation have been investigated. Alumina cannot be formed in air at 1 atm. on binary Nb-Al alloys at any NiAl). Theoretical knowledge of selective oxidation has been applied to Nb-Al alloys to alter behavior. The effects of Al-content, temperature, atmosphere, third element additions, and microstructure on the transition from internal to external oxidation of aluminum has been evaluated and conditions under which protective alumina scales can form on Nb-Al alloys have been defined. Third element additions are required to form protective alumina. The most effective additions are those which can reduce the solubility and diffusivity of oxygen, enhance diffusion of Al, and limit transient oxidation. Additions of Ti, Cr, V and Si were identified as most promising for providing oxidation resistance in Nb-Al alloys. The feasibility of forming compact.

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adherent alumina scales on Nb alloys at a minimum NiAl)=0. 32 in air at 1100-1600 C has been demonstrated. Alumina scale could not be formed below 1100 C. Preoxidation above 1100 C can be used to preform alumina scales that will protect at lower temperatures but is effective only if the alloy is not cooled to room temperature prior to exposure at lower temperatures. Rapid solidification processing does not appear to offer any significant benefit. (AW)

DESCRIPTORS: (U) \*ALUMINUM OXIDES, \*NIOBIUM ALLOYS, \*OXIDATION RESISTANCE, \*SOLIDIFICATION, \*HEAT RESISTANT ALLOYS, \*REACTION KINETICS, ADDITION, ALUMINUM, COOLING, DIFFUSIVITY, ENVIRONMENTS, EXPOSURE(GENERAL), EXTERNAL, FEASIBILITY STUDIES, HIGH TEMPERATURE, KINETICS, LOW TEMPERATURE, MICROSTRUCTURE, NIOBIUM, OXIDATION, OXYGEN, QUICK REACTION, THERMAL RESISTANCE, ROOM TEMPERATURE, SCALE, SOLUBILITY, SURFACES, TRANSIENTS, TRANSITIONS, TITANIUM, CHROMIUM, VANADIUM, SILICON.

IDENTIFIERS: (U) PE61102F, WUAFOSR2306A1.



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AD-A209 920 20/1

STANFORD UNIV CA STANFORD ELECTRONICS LABS

TORONTO UNIV DOWNSVIEW (ONTARIO) INST FOR AEROSPACE STUDIES

(U) Data Compression Algorithms.

(U) Aerodynamically Generated Sound and Subsonic Aerodynamics.

DESCRIPTIVE NOTE. Final rept. 1 May 78-30 Apr 79.

APR 79

DESCRIPTIVE NOTE: Final scientific rept..

PERSONAL AUTHORS: Gray, Robert M.

JAN 79

CONTRACT NO. F49620-78-C-0087

PERSONAL AUTHORS: Ribner, H. S.

PROJECT NO. 2304

CONTRACT NO. AFOSR-75-2808

TASK NO. A6

PROJECT NO. 2307

MONITOR: AFOSR  
TR-89-0880

TASK NO. A2

MONITOR: AFOSR  
TR-89-0873

UNCLASSIFIED REPORT

UNCLASSIFIED REPORT

ABSTRACT: (U) The principal accomplishment of the year was the completion of an experimental and theoretical study of an algorithm for the design of block (or vector) quantizers that are locally optimum in the sense of minimizing average distortion as measured by quite general distortion measures. The algorithm is based either on a probabilistic model of the source to be compressed or on a long sequence of training data produced by the source. Keywords: Data compression; Data processing. (kt)

DESCRIPTORS: (U) \*ALGORITHMS, \*DATA COMPRESSION, DATA PROCESSING, DISTORTION, MATHEMATICAL MODELS, PROBABILITY, SEQUENCES

IDENTIFIERS: (U) PE61102F, WUAFOSR2304AG

ABSTRACT: (U) Jet noise diagnostics were performed by cross-correlating the suspected source terms (e.g., rates of turbulent momentum flux) with the effect they produce. To eliminate the possibility of spurious noise, the source terms were measured with a laser doppler velocimeter and correlated with the far field jet noise (microphone signal). Source distribution over slices of jet inferred therefrom are, unexpectedly, somewhat pear-shaped. Spectra predicted from measured cross-spectral densities are compatible with corresponding spectra extracted from far field intensities and with theory. Experimental studies of unorthodox concepts for shielding jet noise were carried out. Only modes attenuation of the park jet noise was found with a family of half round 'sugar scoop' shields (e.g., 5-6 PNdB when scaled to a full size engine), owing largely to 'edge noise' from jet interference. Another shielding concept involved extending the effective length of the 'sugar scoops' by means of a hot refractive layer (array of flames). Marginal increases in shielding were found. Keywords: Jet aircraft noise; Sonic boom; Aeroacoustics; Thunder; Blast waves; Noise reduction; Canada. (EDC)

DESCRIPTORS: (U) \*AERODYNAMIC NOISE, \*JET AIRCRAFT NOISE, ACOUSTIC MEASUREMENT, ACOUSTICS, AERODYNAMICS.

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ATTENUATION, BLAST WAVES, CANADA, CROSS CORRELATION, DENSITY, DIAGNOSIS(GENERAL), DISTRIBUTION, DOPPLER SYSTEMS, EDGES, ENGINES, EXPERIMENTAL DATA, FAR FIELD, FLAMES, FLUX(RATE), HIGH TEMPERATURE, INTENSITY, JET ENGINE NOISE, LASER VELOCIMETERS, LAYERS, MICROPHONES, MOMENTUM, NOISE, NOISE REDUCTION, REFRACTION, SCOOPS, SHIELDING, ACOUSTIC SIGNALS, SONIC BOOM, SOUND, SOURCES, SPECTRA, SUBSONIC CHARACTERISTICS, TURBULENCE.

CLEMSON UNIV S C DEPT OF ZOOLOGY

(U) Radar Techniques for Air Force Applications in Avoidance of Bird-Aircraft Collisions and Improvement of Flight Safety.

DESCRIPTIVE NOTE: Final technical rept. 1 Jun-31 Dec 78.

FEB 79

IDENTIFIERS: (U) Thunder, Aeroacoustics, PE61102F, WJAFOSR2307A2.

PERSONAL AUTHORS: Gauthreaux, Sidney A., Jr

CONTRACT NO. AFOSR-75-2782

PROJECT NO. 2312

TASK NO. A4

MONITOR: AFOSR  
TR-89-0868

UNCLASSIFIED REPORT

ABSTRACT: (U) Evaluation of the influence of aircraft landing lights on flight behavior of migrating birds at night has been completed. Birds do not make evasive maneuvers to avoid approaching aircrafts with their landing lights on. Evaluation of the AN/TVS-5 image intensifier shows that it is an ideal instrument to use in quantifying and monitoring bird migrations. The correlation between migration traffic rate and the density of bird echoes on the radar screen is identical on different nights when the magnitude of migration is the same. An automatic system composed of an image intensifier in combination with a closed circuit television video tape system has been developed to gather more accurate data on nocturnal migration keywords: Bird strikes; Collision avoidance; Radar; Nocturnal bird migration; Animal migration. (KT)

DESCRIPTORS: (U) \*BIRD STRIKES, \*COLLISION AVOIDANCE, ACCURACY, AIR FORCE OPERATIONS, AIRCRAFT LANDINGS, ANIMAL MIGRATION, AUTOMATIC, AVIATION SAFETY, BIRDS, CATHODE RAY TUBE SCREENS, AVIATION SAFETY, ECHOES, FLIGHT ENVELOPE, IMAGE INTENSIFIERS(ELECTRONICS), INSTRUMENTATION, LANDING LIGHTS, MIGRATION, MILITARY APPLICATIONS, MONITORING, NIGHT, RADAR, RADAR EQUIPMENT, RATES, TRAFFIC.

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AD-A209 918 6/4

IDENTIFIERS: (U) PE61102F, WUAFOSR2312A4, AN/TVS-5.

NEW YORK UNIV N Y

(U) Modulation of Spontaneous Brain Activity During Mental Imagery.

DESCRIPTIVE NOTE: Rep. for 1 Mar 88-28 Feb 89.

MAY 89

PERSONAL AUTHORS: Kaufman, Lloyd

CONTRACT NO. F49620-88-K-0004

PROJECT NO. 2313

TASK NO. A4

MONITOR: AFOSR  
TR-89-0961

UNCLASSIFIED REPORT

ABSTRACT: (U) Magnetic measurements of average power of human alpha activity over the occipital and parietal areas of the scalp reveal spatially selective suppression when abstract figures are briefly presented visually. The duration of suppression increases along with reaction time during a search of visual memory. This implies that the visual system is involved in mental imagery. Keywords: Brain function; Neural activity. (KT)

DESCRIPTORS: (U) \*BRAIN, \*NEUROPHYSIOLOGY, \*NERVE IMPULSES, \*NEURAL NETS, ABSTRACTS, FUNCTIONS, HEAD(ANATOMY), HUMANS, MAGNETIC FIELDS, MEASUREMENT, MEMORY(PSYCHOLOGY), MODULATION, OPTICAL IMAGES, REACTION TIME, SEARCHING, SKIN(ANATOMY), SUPPRESSION, TIME, VISION

IDENTIFIERS: (U) PE61102F, WUAFOSR2313A4, \*Brain Activity, \*Brain function.

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NEW YORK UNIV N Y

(U) Attention, Imagery and Memory: A Neuromagnetic Investigation.

produced a profound change in activity cortex during imaging. Acoustically presented words were also found to produce changes in MEG activity arising in the visual areas when they were used as cues to forming a mental image. (AW)

DESCRIPTIVE NOTE: Annual technical rept. 1 Mar 88-28 Feb 89.

MAY 89

PERSONAL AUTHQRS: Kaufman, Lloyd

CONTRACT NO. F49620-88-K-0004

PROJECT NO. 2313

TASK NO. A4

MONITOR: AFOSR  
TR-89-0960

DESCRIPTORS: (U) \*MEMORY(PSYCHOLOGY), \*OPTICAL IMAGES, \*VISION, \*VISUAL CORTEX, \*ATTENTION, ALPHA SPECTRA, BRAIN, IMAGES, MAGNETOENCEPHALOGRAMS, MEAN, MENTAL ABILITY, POWER, REACTION TIME, REDUCTION, SEARCHING, TIME, CUES(STIMULI).

IDENTIFIERS: (U) PE61102F, WUAFOSR2313A4, Mental Images.

## UNCLASSIFIED REPORT

ABSTRACT: (U) This report describes a number of experiments related to the effects of mental imagery and other high-level cognitive tasks on the spontaneous activity of the brain. The basic procedure involves narrowly bandpassing the magnetoencephalogram (MEG), computing the average response to a stimulus or event within that bandpass, and computing the variance around the average. The variance at any point in time subsequent to the stimulus is a measure of mean square field (power). Power in the alpha band (8-12 Hz) was found to show a prominent change in level subsequent to presentation of form. Simply watching the form results in a dip in alpha power, but when subjects attempt to determine if the form had been seen previously, the duration of the reduction in alpha power increases significantly, and is correlated with reaction time (RT). The distribution of alpha across the occipital and parietal areas shows remarkable individual differences in both symmetry and magnitude. The changes in this distribution during the course of performing a search of visual memory suggests that the effects are localized to visual cortex. In another experiment subjects either tried and form an image of an object represented by a visually presented word, or to find a rhyming word. The latter task did not produce a change in activity of visual cortex, while the same words

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STANFORD UNIV CA DEPT OF AERONAUTICS AND ASTRONAUTICS

WISCONSIN UNIV-MADISON DEPT OF CHEMISTRY

(U) Development of Analytical and Semi-Numerical Methods of Flow Calculation.

(U) Three-, Four-, and Five-Membered Rings from Disilenes.

89

DESCRIPTIVE NOTE: Final scientific rept. 1 Dec 73-30 Nov 78.

PERSONAL AUTHORS: West, Robert; Gillette, Gregory R.; Yokelson, H. B.; Millevolte, A. J.

JAN 79

PERSONAL AUTHORS: Van Dyke, Milton

CONTRACT NO. F49620-86-C-0010

CONTRACT NO. AFOSR-74-2649

PROJECT NO. 2303

PROJECT NO. 2307

TASK NO. B2

TASK NO. A4

MONITOR: AFOSR TR-89-0795

MONITOR: AFOSR TR-89-0872

UNCLASSIFIED REPORT

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Phosphorus, Sulfur and Silica, v41 p3-14 1989.

DESCRIPTORS: (U) \*FLUID DYNAMICS, \*COMPUTER APPLICATIONS, FLOW FIELDS, COMPUTATIONS, VORTICES, BOUNDARY LAYER FLOW, FLOW PIPES, LAMINAR FLOW, VISCOUS FLOW, SHOCK WAVES, TRANSONIC FLOW.

ABSTRACT: (U) Disilenes, R2Si=SiR2, react with many substances to produce cyclic compounds containing two silicon atoms and one or more heteroatoms. Most of these products are new ring systems, and some show abnormal structures with short Si-Si bonds, suggesting unusual chemical bonding. Keywords: Disiloxanes; Siloxanes; Dioxigen; Chalcogens; Azides; Diazomethanes; Isocyanides; Disilacyclopropanimine; Chemical reactions; Reprints. (aw)

IDENTIFIERS: (U) PE61102F, WUAFOSR2307A4.

DESCRIPTORS: (U) \*CYCLIC COMPOUNDS, \*MOLECULAR STRUCTURE, \*SILICON COMPOUNDS, ABNORMALITIES, ATOMS, AZIDES, CHALCOGENS, CHEMICAL BONDS, CHEMICAL REACTIONS, REPRINTS, RINGS, SILICON, SILOXANES.

IDENTIFIERS: (U) PE61102F, WUAFOSR2303B2, \*Disilenes, Heteroatoms, Dioxigen, Diazomethanes, Isocyanides, Disilacyclopropanimine, Rings(Cyclic Compounds).

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FLORIDA UNIV GAINESVILLE

UNIVERSITY OF SOUTHERN CALIFORNIA LOS ANGELES LOKER  
HYDROCARBON RESEARCH INST

(U) Probabilistic Analysis of Semilinear Partial  
Differential Equations.

(U) Reaction of E-1,4-Poly(2-Triethylsilyl-1,3-Butadiene)  
with Iodine Monochloride,

DESCRIPTIVE NOTE: Final rept. 30 Sep 85-29 Mar 89,

89

MAY 89

PERSONAL AUTHORS: Glover, Joseph; Chung, Kai L.

PERSONAL AUTHORS: Wan, Jjiang; Weber, William P.

CONTRACT NO. AFOSR-85-0330

CONTRACT NO. AFOSR-89-0007

PROJECT NO. 2304

PROJECT NO. 2303

TASK NO. A5

TASK NO. B2

MONITOR: AFOSR

MONITOR: AFOSR

TR-89-0806

TR-89-0837

UNCLASSIFIED REPORT

UNCLASSIFIED REPORT

ABSTRACT: (U) A major thrust of the original proposal was to find new probabilistic methods for dealing with semilinear partial differential equations. Mathematicians are currently devoting more of their attention to studying nonlinear partial differential equations since they recognize that descriptions of physical phenomena must incorporate nonlinear behavior. The author succeeded in finding a method for solving systems of semilinear elliptic equations by a new procedure which does not need the old hypotheses of quasi-monotone systems. It combines probability, analysis and a transfinite induction scheme to solve equations of a certain on a domain  $E$  in  $R$  sub  $d$  subject to boundary conditions  $u$  sub  $1$  =  $u$  sub  $2$  = ...  $u$  sub  $n$  0 on the boundary of  $E$ . (kr)

DESCRIPTORS: (U) \*PARTIAL DIFFERENTIAL EQUATIONS, \*PROBABILITY, BEHAVIOR, ELLIPSES, EQUATIONS, HYPOTHESES, INDUCTION SYSTEMS, MATHEMATICS, METHODOLOGY, NONLINEAR DIFFERENTIAL EQUATIONS, NONLINEAR SYSTEMS.

IDENTIFIERS: (U) PE61102F, WUAFOSR2304A5.

SUPPLEMENTARY NOTE: Pub. in Polymer Bulletin, v21 p427-432 1989.

ABSTRACT: (U) Addition of iodine monochloride to E-1,4-poly(2-triethylsilyl-1,3-butadiene) (I) followed by treatment with potassium fluoride dihydrate yields a copolymer comprised of E and Z-1,4(2-iodo-1,3-butadiene) (E and Z-II) units and Z-1,4-(2-chloro-1,3-butadiene) (Z-III) units. The mechanism of this reaction is discussed. The product copolymer has been characterized by <sup>1</sup>H and <sup>13</sup>C NMR, IR, UV, GPC, TGA and elemental analysis. Keywords: Electrophilic substitution; Reprints. (AW)

DESCRIPTORS: (U) \*CHLORIDES, \*IODINE COMPOUNDS, \*POLYBUTADIENE, \*CHEMICAL REACTIONS, COPOLYMERS, REPRINTS, SUBSTITUTION REACTIONS, POTASSIUM COMPOUNDS, FLUORIDES, SILICON, ETHYL RADICALS.

IDENTIFIERS: (U) PE61102F, WUAFOSR2303B2, Butadiene/E-1-4-Poly(2-Triethylsilyl-1-3), Electrophilic Substitution Reactions, Iodine Monochloride.

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AD-A209 897 17/10 19/9 CONTINUED

SOUTHERN METHODIST UNIV DALLAS TX DEPT OF GEOLOGICAL SCIENCES

(U) Effects of Source Depth on Near-Source Seismograms.

MAY 88

PERSONAL AUTHORS: Flynn, Elizabeth C.; Stump, Brian W.

CONTRACT NO. AFOSR-84-0018

PROJECT NO. 2309

TASK NO. A2

MONITOR: AFOSR  
TR-89-0842

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Jnl. of Geophysical Research,  
V93 n85 p4820-4834, 10 May 88.

ABSTRACT: (U) Source depth effects are examined for five 115-kg explosions buried at depths ranging from the optimum cratering depth of 1.8 m to the fully contained depth of 11.5 m. Data were recovered at near source ranges from 17 to 228 m. The waveforms are dominated by P and SV-Rayleigh energy. Depth effects are evident in the increase of P to SV-Rayleigh amplitude ratios and in the twofold increase of high-frequency energy for the deeper sources. Theoretical propagation depth effects are modeled by Green's functions calculated for a velocity gradient which approximates the velocity structure of the experimental site. The effects of depth on the explosion source function are predicted using the scaling laws of Mueller and Murphy (1971). These models did not reproduce the observed twofold increase of high-frequency energy. The discrepancy between the model and observations is attributed to increased coupling of high frequency P wave energy for fully contained sources. Energy calculations confirm that the shallowest event coupled 40% and the fully contained event 80% of the total seismic energy into the P wave. Source coupling efficiencies ranged from 0.7-1.0% for the near surface source to 1.5-2.9% for the fully contained explosion. Reprints. (EDC)

DESCRIPTORS: (U) \*EXPLOSION EFFECTS. \*SEISMIC WAVES.

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AMPLITUDE COMPUTATIONS, CONTAINMENT(GENERAL), COUPLING(INTERACTION), CRATERING, DEPTH, EFFICIENCY, ENERGY, EXPLOSIONS, FUNCTIONS(MATHEMATICS), GRADIENTS, GREENS FUNCTION, HIGH FREQUENCY, NEAR FIELD, NUCLEAR EXPLOSION SIMULATION, OPTIMIZATION, PRIMARY WAVES(SEISMIC WAVES), WAVE PROPAGATION, RATIOS, REPRINTS, SCALING FACTOR, SEISMIC DATA, SITES, SOURCES, SURFACES, VELOCITY. IDENTIFIERS: (U) Source depth, PE61102F, WUAFOSR2309A2.

UNCLASSIFIED

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVI09K

AD-A209 896

7/4

COLUMBIA UNIV NEW YORK DEPT OF CHEMISTRY

(U) Emission Properties of Dioxorhenium(V) Complexes in Aqueous Solutions of Anionic and Nonionic Surfactants: A Sensitive Probe of Hydrophobic Binding Regions.

DESCRIPTIVE NOTE: Rept. for 1987-1988.

89

PERSONAL AUTHORS: Thorp, H. H.; Kumar, Challa V.; Turro, Nicholas J.; Gray, Harry B.

REPORT NO. CONTRIB-7725

CONTRACT NO. AFOSR-88-0043, NSF-CHE85-18793

PROJECT NO. 2303

TASK NO. 82

MONITOR: AFOSR  
TR-89-0836

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Jnl. of American Chemical Society, v111 n12 p4364-4368 1989.

ABSTRACT: (U) The emission properties of  $\text{ReO}_2(\text{py})_4(+)$  ( $\text{ReO}_2(+)$ ) in aqueous solutions of anionic and nonionic surfactants have been investigated. The optical properties of this complex are extremely sensitive to water and therefore, it is an excellent probe of hydrophobic as well as hydrophilic regions. The emission and absorption maxima of  $\text{ReO}_2(+)$  are dependent on the water content of its environment. Emission lifetimes vary over four orders of magnitude upon shifting from aqueous to nonaqueous environments. The emission lifetime has a large (8.6) isotope effect ( $k(\text{H}_2\text{O})/k(\text{D}_2\text{O})$ ) that reflects its sensitivity toward the environment. These properties have been used to develop a structural and kinetic model for the interactions of  $\text{ReO}_2(+)$  with sodium dodecyl sulfate (SDS). A hydrophobic  $\text{ReO}_2$  + derivative,  $\text{ReO}_2(3\text{-Ph-py})_4(+)$  (3-Ph-py=3phenylpyridine), has been used to probe micelles of nonionic surfactants and these results are consistent with those obtained with SDS. Reprints. (aw)

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AD-A209 896 CONTINUED

DESCRIPTORS: (U) \*HYDROPHOBIC PROPERTIES, \*RHENIUM COMPOUNDS, \*OXIDES, \*SURFACE ACTIVE SUBSTANCES, \*EMISSION SPECTRA, ABSORPTION, COLLOIDS, EMISSION, ISOTOPE EFFECT, KINETICS, MODELS, MOISTURE CONTENT, OPTICAL PROPERTIES, PROBES, REGIONS, REPRINTS, SENSITIVITY, SODIUM, SOLUTIONS(MIXTURES), WATER, METAL COMPLEXES, CHEMICAL BONDS, PYRIDINES, SULFATES.

IDENTIFIERS: (U) WUAFOSR2303B2, PE61102F, Dioxorhenium Complexes, Hydrophilic, Phenylpyridines, Sulfate/Sodium Dodecyl.



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DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVI09K

AD-A209 895 CONTINUED

AD-A209 895 7/4 20/5

COLORADO UNIV AT BOULDER DEPT OF CHEMISTRY AND BIOCHEMISTRY

(U) The Dipole Moment Function and Vibrational Transition Intensities of OH.

MAY 89

PERSONAL AUTHORS: Nelson, David D., Jr.; Schiffman, Aram; Nesbitt, David J.

CONTRACT NO. F49620-86-C-0056

PROJECT NO. 2303

TASK NO. B1

MONITOR: AFOSR  
TR-89-0838

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Jnl. of Chemical Physics, v90  
n10 p5455-5465, 15 May 89.

ABSTRACT: (U) The relative intensities of nine pairs of rovibrational transitions of OH in the  $v=0$  to 1 transition fundamental have been measured by flash kinetic infrared absorption spectroscopy. Each pair of transitions originates from a common rotational and spin-orbit state, so that relative intensities are independent of the OH number density and quantum state distribution. The relative intensities are strongly J dependent and this dependence provides detailed information about the shape of the OH dipole moment function,  $\mu(r)$ , and hence the absolute infrared transition strengths. In an accompanying paper we present the theoretical basis for extracting  $\mu(r)$ , for an open shell diatomic like OH, from relative infrared intensities and permanent dipole moment measurements. In this work we implement those ideas and determine the OH dipole moment function. The accuracy of  $\mu(r)$  is excellent since the data used to derive it are from low vibrational states. The useful range of this function extends from approximately 0.75 to 1.35 Å. The rotationless Einstein A coefficient for the OH fundamental is determined from  $\mu(r)$  to be 16.7 (19) Hz. Keywords: Flash kinetic spectroscopy; HNO photolysis; Vibrational emission, Reprints. (aw)

DESCRIPTORS: (U) \*DIPOLE MOMENTS, \*HYDROXYL RADICALS, \*VIBRATIONAL SPECTRA, ACCURACY, COEFFICIENTS, DENSITY, DISTRIBUTION, EMISSION, FLASHES, FUNCTIONS, INFRARED SPECTRA, INTENSITY, KINETICS, MEASUREMENT, PHOTOLYSIS, QUANTUM THEORY, REPRINTS, SPECTROSCOPY, SPINNING(MOTION), STRENGTH(GENERAL), ELECTRON TRANSITIONS, MOLECULAR VIBRATION, MOLECULAR ORBITALS, MOLECULAR ROTATION, SPIN STATES, DIATOMIC MOLECULES.

IDENTIFIERS: (U) PEG1102F, WUAFOSR2303B1.

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DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EV109K

AD-A209 894 CONTINUED

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COLORADO UNIV AT BOULDER DEPT OF CHEMISTRY AND  
BIOCHEMISTRY

(U) Absolute Infrared Transition Moments for Open Shell  
Diatomics from J Dependence of Transition Intensities:  
Application to OH.

MAY 89

PERSONAL AUTHORS: Nelson, David D., Jr.; Schiffman, Aram;  
Nesbitt, David J.; Yaron, David J.

CONTRACT NO. F49620-86-C-0058

PROJECT NO. 2303

TASK NO. B1

MONITOR: AFOSR  
TR-89-0839

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Jnl. of Chemical Physics, v90  
n10 p5443-5454, 15 May 89.

ABSTRACT: (U) A general approach to the determination of  
the dipole moment function and of the absolute  
vibrational transition moments for diatomic molecules is  
presented. This method utilizes the variation of  
intensity with J within a vibrational transition,  
together with permanent dipole moment information, to  
extract the absolute transition moments. An essential  
feature of the model is its use of algebraic expressions  
for calculating vibration-rotation line intensities.  
These expressions can be rapidly evaluated in a least  
squares fit which determines the dipole moment function.  
This approach is general in that it is not limited to 1  
sigma state molecules, nor to the simplest of Hund's case  
couplings of spin, orbital and mechanical angular  
momentum. It is successfully applied to the OH molecule  
which violates each of these restrictions. In the  
accompanying work we report experimental measurements of  
relative infrared absorption intensity measurements for  
OH v=0 to 1 transitions and the extraction of an  
experimental (r) using the approach presented here.  
Keywords: Absorption spectra, Herman Wallis effect;  
Reprints. (aw)

DESCRIPTORS: (U) \*ABSORPTION SPECTRA, \*DIATOMIC  
MOLECULES, \*DIPOLE MOMENTS, \*ELECTRON TRANSITIONS,  
\*HYDROXYL RADICALS, \*VIBRATIONAL SPECTRA, ALGEBRAIC  
FUNCTIONS, ANGULAR MOMENTUM, COUPLINGS, EXPERIMENTAL DATA,  
FUNCTIONS, INFRARED SPECTRA, INTENSITY, MEASUREMENT,  
MOLECULAR ORBITALS, REPORTS, REPRINTS, SPINNING(MOTION),  
VARIATIONS, MOLECULAR VIBRATION, MOLECULAR ROTATION,  
MOLECULAR ENERGY LEVELS.

IDENTIFIERS: (U) PE61102F, WUAFOSR2303B1, Herman Wallis  
Effect, Shells(Energy Levels).

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AD-A209 887 7/3

UNIVERSITY OF SOUTHERN CALIFORNIA LOS ANGELES LOKER  
HYDROCARBON RESEARCH INST

CORNELL UNIV ITHACA NY DEPT OF CHEMISTRY

(U) Reduction Silylation of Chloroprene.  
(U) ETA(2)-(N,C)-Pyridine Micrometers-ETA(2)(1,2):ETA(2)(1,4,  
5)-Benzene Complexes of (Silox)3Ta (Silox = t-Bu3SiO ).

89

83

PERSONAL AUTHORS: Jiang, Wan; Weber, William

PERSONAL AUTHORS: Neithamer, David R.; Parkanyi, Laszlo;  
Mitchell, John F.; Wolczanski, Peter T.

CONTRACT NO. AFOSR-89-0007

CONTRACT NO. AFOSR-87-0103

PROJECT NO. 2303

PROJECT NO. 2303

TASK NO. B2

TASK NO. B2

MONITOR: AFOSR  
TR-89-0798MONITOR: AFOSR  
TR-89-0827

## UNCLASSIFIED REPORT

## UNCLASSIFIED REPORT

ABSTRACT: (U) Copolymers made up of 1,4-(2-trimethylsilyl)-1,3-butadiene (I) and 1,4-(2-chloro-1,3-butadiene) (II) units have been prepared by reaction of chloroprene with trimethylchlorosilane and sodium dispersion in THF. The ratio of I:II units in the copolymers have been determined by IR, <sup>1</sup>H NMR and elemental analysis. The E:Z ratio of these units has been determined by <sup>1</sup>H NMR, <sup>13</sup>C and <sup>29</sup>Si NMR of these copolymers is discussed. Keywords: Reductive silylation; Reprints. (aw)

DESCRIPTORS: (U) \*CHLOROSILANES, \*POLYBUTADIENE, \*CHLOROPRENES, \*REDUCTION(CHEMISTRY), COPOLYMERS, DISPERSING, METHYL RADICALS, RATIOS, REPRINTS, SODIUM.

IDENTIFIERS: (U) PEG1102F, WUAFOSR2303B2, \*Silylation, Butadiene/1-4-(2-Trimethylsilyl-1-3), Butadiene/1-4-(2-Chloro-1-3).

SUPPLEMENTARY NOTE: Pub. in Jnl. of the American Chemical Society, v110 n13 p4421-4423 1988.

ABSTRACT: (U) The unusual capability of transition metals to coordinate to pi-systems of organic molecules is recognized as playing a historic and important role in the growth of organometallic chemistry. This development is manifested in the widespread usage of aromatic hydrocarbons, such as cyclopentadienyl anion and arenes, as ancillary ligands bound with maximum hapticity to various metals. Less common, but inherently interesting, are modes of binding which disturb the aromaticity of the fragment, yet fall short of utilizing the hydrocarbon's full complement of pi-electrons. Presented herein are pyridine (eta 2)7 and benzene mu (eta 2) (1,2)(eta 2(4,5) adducts of (silox)3Ta (1,silox = t-Bu3SiO-)8 which exhibit intriguing coordination geometries. Reprints. (AW)

DESCRIPTORS: (U) \*BENZENE, \*ORGANOMETALLIC COMPOUNDS, \*PYRIDINES, \*SILOXANES, AROMATIC HYDROCARBONS, CHEMISTRY, GROWTH(GENERAL), LIGANDS, METALS, MOLECULES, ORGANIC COMPOUNDS, REPRINTS, TRANSITION METALS.

IDENTIFIERS: (U) Cyclopentadienyl Anions, Arenes, Hapticity.

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AD-A209 886 CONTINUED

DANISH ATOMIC ENERGY COMMISSION ROSKILDE ACCELERATOR  
SECTION

(U) Negative Temperature Dependence in the Decay of  
Triplet Biradicals.  
IDENTIFIERS: (U) PE61102F, WUAFOSR2303B2,  
\*Diphenylalkanes, Alkane/N-Diphenyl-1, Mean Life,  
Lifetime, Triplet State, Biradicals,  
\*Diphenylcycloalkanes, Alkanones, Intersystem Crossing.

88

PERSONAL AUTHORS: Wang, Jinfeng; Doubleday, Charles E.,  
Jr.; Turro, Nicholas J.

CONTRACT NO. AFOSR-88-0043

PROJECT NO. 2303

TASK NO. 82

MONITOR: AFOSR  
TR-89-0799

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Jnl. of the American Chemical  
Society, v111 p3962-3965 1988.

ABSTRACT: (U) The lifetimes of the 1, n-diphenylalkane-1,  
n-diyl triplet biradicals 3n derived from type I  
photolyses of alpha, alpha-diphenylcycloalkanes were  
studied by nanosecond transient absorption as a function  
of biradical chain length n and temperature. Intermediate-  
length biradicals 3(5,8,9) have no longer lifetimes than  
smaller 3(3,4) or larger 3(11,14) biradicals. The  
temperature dependence of the biradical lifetimes was  
measured in methanol and nonane solvents for biradicals  
3(5,9,11). For 3(5) the Arrhenius activation energy  
for decay is normal. However, for 3(9,11) a novel  
negative activation energy has been observed in the range  
0-100 C. The results are interpreted in terms of an  
intrinsic relation between the sign of the high-  
temperature Arrhenius slope and the mechanism of  
intersystem crossing in the biradical. Keywords:  
Temperature dependence; Intersystem crossing. Reprints.  
(aw)

DESCRIPTORS: (U) \*ALKANES, \*CHEMICAL RADICALS, \*DECAY,  
ABSORPTION, ACTIVATION ENERGY, CARBINOLS, NONANE,  
REPRINTS, SOLVENTS, THERMAL PROPERTIES, TRANSIENTS,  
PHENYL RADICALS

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AD-A209 884 6/4

JOHNS HOPKINS UNIV BALTIMORE MD

(U) Pre-Attentive and Attentive Visual Information Processing.

DESCRIPTIVE NOTE: Annual rept. 2 Apr 88-3 Mar 89.

JUN 89

PERSONAL AUTHORS: Egeth, H. E.

CONTRACT NO. AFOSR-87-0180

PROJECT NO. 2313

TASK NO. A4

MONITOR: AFOSR  
TR-89-0815

UNCLASSIFIED REPORT

ABSTRACT: (U) Research on several interrelated topics is described in this report. These projects are focused on the analysis of feature and conjunction detection, models of selective attention, and curve tracing. One project examines the effects of a heterogeneous background on feature search. Another assesses spatial factors (such as target-distractor separation) in the detection of targets defined in terms of simple features. A third project has the goal of developing methods for determining the extent to which processing is serial or parallel. A fourth represents initial efforts to determine whether conjoined features are represented in retinotopic or spatiotopic 'maps'. A fifth explores top-down and bottom-up factors in visual search. A sixth makes use of an inhibitory priming method to test early- and late-selection models of selective attention. Finally, a project is reported in which the operation of visual curve tracing is studied. Keywords: Visual perception; Attention; Perception; Information processing; Vision; Visual search; Curve tracing. (kt)

DESCRIPTORS: (U) \*DETECTION, \*INFORMATION PROCESSING, \*OPTICAL IMAGES, \*SEARCHING, \*TARGETS, \*VISION, \*VISUAL PERCEPTION, BACKGROUND, CURVE FITTING, HETEROGENEITY, INHIBITION, PERCEPTION, PRIMERS, SPATIAL DISTRIBUTION.

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AD-A209 880 14/2 12/3 12/4 12/9

ILLINOIS UNIV AT CHICAGO CIRCLE DEPT OF MATHEMATICS  
STATISTICS AND COMPUTER SCIENCE

(U) Design of Experiments and Reliability Models.

DESCRIPTIVE NOTE: Final rept. 1 Aug 85-31 Oct 88.

MAY 89

PERSONAL AUTHORS: Hedayat, A. S.; El-Newehi, E.

CONTRACT NO. AFOSR-85-0320

PROJECT NO. 2304

TASK NO. A5

MONITOR: AFOSR  
TR-89-0772

UNCLASSIFIED REPORT

ABSTRACT: (U) Our research in design of experiments included the following areas: 1) Efficient designs for experiments involving several factors; 2) Efficient designs for repeated measurements models; 3) Trade off in designs; 4) Flexible orthogonal arrays; 5) Efficient designs for comparing test treatments with controls; and 6) Designs for collecting data through sampling. Our research in reliability has been mainly directed to the following areas: 1) Multistate reliability models; 2) Optimal assembly of coherent systems (both in the binary and multistate cases); 3) Redundancy importance and allocation of spares in coherent systems; 4) Closure properties of classes of life distributions; and 5) Optimal inspection policies. (EDC)

DESCRIPTORS: (U) \*EXPERIMENTAL DESIGN, \*RELIABILITY, ALLOCATIONS, ARRAYS, ASSEMBLY, CLOSURES, COHERENCE, DATA ACQUISITION, FLEXIBLE STRUCTURES, INSPECTION, LIFE EXPECTANCY(SERVICE LIFE), MODELS, OPTIMIZATION, ORTHOGONALITY, POLICIES, REDUNDANCY, SAMPLING, TEST AND EVALUATION, TRADE OFF ANALYSIS, SPARE PARTS.

IDENTIFIERS: (U) PEG1102F, WUAFOSR2304A5.

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AD-A209 875 CONTINUED

CREARE INC HANOVER NH

(U) Superconducting Meissner Effect Bearings for Cryogenic Turbomachines. Phase 1.

DESCRIPTIVE NOTE: Final rept. Sep 88-Mar 89.

MAY 89

PERSONAL AUTHORS: Iannello, Victor; Marshall, Jeffrey S.; Stacy, W. D.

REPORT NO. CREARE-TM-1352

CONTRACT NO. F49620-88-C-0137

PROJECT NO. K822

TASK NO. F1

MONITOR: AFOSR  
TR-89-0825

## UNCLASSIFIED REPORT

ABSTRACT: (U) State of the art miniature expansion turbines and centrifugal compressors used in spaceborne sensor cryocoolers employ self-acting gas bearings to achieve high reliability and long operating life. Because these bearings must run at room temperature to achieve adequate stiffness and stability, they result in an avoidable source of heat leak to the process gas, thereby lowering overall cycle efficiency and increasing the system launch weight. This report shows that the gas bearings can be replaced by Meissner effect bearings fabricated from high temperature superconducting materials. Analyses are presented to predict Meissner bearing performance, and a preliminary design of a miniature expansion incorporating Meissner bearings is conceptualized. Because these bearings operate at a cryogenic temperatures, a substantial reduction in heat leak to the process gas can be achieved. For a typical cryocooler providing 1 watt of cooling at 10 K, a 40% reduction in input cycle power can be achieved by replacing the self-acting gas bearings by Meissner bearings in the cold expansion turbine.

DESCRIPTORS: (U) \*BEARINGS, \*CENTRIFUGAL COMPRESSORS.

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\*CRYOGENICS, \*MINIATURIZATION, \*SUPERCONDUCTORS, \*TURBINES, \*TURBOMACHINERY, COOLING AND VENTILATING EQUIPMENT, CYCLES, DETECTORS, EFFICIENCY, EXPANSION, GAS BEARINGS, HEAT, HIGH RELIABILITY, HIGH TEMPERATURE, INPUT, LAUNCHING, LOW TEMPERATURE, MATERIALS, POWER, ROOM TEMPERATURE, SELF OPERATION, SPACEBORNE, STIFFNESS, WEIGHT.

IDENTIFIERS: (U) Meissner Effect, PE61102F, WUAFOSRK822F1.

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DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVI09K

AD A209 870 9.3 20/4

AD-A209 870 CONTINUED

WASHINGTON UNIV SEATTLE COLL OF ENGINEERING

DESCRIPTORS: (U) \*CHEMICAL LASERS, \*GAS DYNAMIC LASERS, CAVITIES, CHEMICAL REACTIONS, COMBUSTION, DIFFUSION, ENERGY, EXPANSION, FLOW, FLUID DYNAMICS, FLUID FLOW, HEAT, HEAT TRANSFER, HIGH ENERGY, HIGH RATE, HIGH VELOCITY, ISOLATION, LASER BEAMS, LAYERS, MASS FLOW, MIXING, MOLECULES, NONEQUILIBRIUM FLOW, NOZZLES, PLENUM CHAMBERS, QUALITY, RECOVERY, SUPERSONIC DIFFUSERS, TEMPERATURE, TURBULENCE, WAKE, WALLS.

(U) Laser Mixing Processes.

DESCRIPTIVE NOTE: Final rept. 1 Jul 77-21 Oct 78.

79

PERSONAL AUTHORS: Russell, David A.

CONTRACT NO AFOSR-77-3450

IDENTIFIERS: (U) \*Supersonic Diffusion Lasers, High Energy Lasers, PEG1102F, WUAF0SR2307A1.

PROJECT NO 2307

TASK NO A1

MONITOR AFOSR  
TR-89 0886

UNCLASSIFIED REPORT

ABSTRACT. (U) The high energy laser was made possible by the application of high speed fluid flow to basic molecular processes. The flow is used to remove waste heat, to provide a high mass flow for compactness and a high total pressure for gas recovery, to enhance lasing through reduced cavity temperatures, and to drop the density and thus the flow uniformity necessary for beam quality. Further, it is the rapid expansion of the plenum gas that provides non-equilibrium energy for the gasdynamic laser (GDL), and provides fast mixing and upstream isolation for the chemical supersonic diffusion laser (SDL). Thus, the 20-50 kw/kgm/sec output of modern high energy lasers is integrally tied to the development of a new class of fluid flows involving non-equilibrium/ reacting gases in a radiation-extraction cavity. High flow quality is essential if the laser beam is not to be degraded, and the wave systems, wakes, mixing layers, turbulence levels, and wall layers must be controlled. Consideration must be given to combustion processes in plenums and mixing layers, heat transfer in the expansion nozzles, aerodynamic beam-extraction windows, and downstream recovery of the working fluid to ambient conditions. In addition to the obvious concerns of efficiency and size, there are thus many reasons why laser possibilities are often paced by fluid dynamics. (UHD)

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AD-A209 869 CONTINUED

AD A209 869 20.6

WASHINGTON UNIV SEATTLE COLL OF ENGINEERING

(U) Phase Compensation for High Power Lasers Using  
Refracting Gas Prisms.

DESCRIPTIVE NOTE: Final rept. 1 May 77-31 Oct 78.

JAN 79

PERSONAL AUTHORS: Christlansen, W.; Bogdanoff, D.;  
Wasserstrom, F.

CONTRACT NO AFOSR-77-331a

PROJECT NO 2307

TASK NO A1

MONITOR AFOSR  
TR-89-0885

UNCLASSIFIED REPORT

ABSTRACT: (U) Laser beams propagating through the atmosphere are subject to considerable phase distortion due to variations of the air density. The beams emitted by high power lasers can also be distorted due to density variations inside the laser cavity. One of the main applications of active optics is the compensation of these wavefront distortions in order to enhance the intensity of a laser beam on a distant target. A new method of phase compensation using the refractive properties of gas jets is being investigated as an alternative method for phase front control. Gases of sufficient optical properties (index of refraction) with laser so that passage through the gas elements produces phase shifts in the beam itself. Actively changing the gas index of refraction using flow will permit the control necessary to achieve phase compensation. The geometry required to bring about localized phase compensation in the laser beam is possible by using independent jets of gas each with its own dither and feedback circuiting as is done with conventional COAT technology. By replacing the solid array elements by jets of gas of varying refractive index, the power handling capacity of the COAT system can be raised to very high levels while maintaining a frequency response in the

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kilocycle range. This is the essence of the fluid COAT idea. Coherent Adaptive Optical Techniques. (JHD)  
DESCRIPTORS: (U) \*COMPENSATION, \*DISTORTION, \*PHASE DISTORTION, \*PHASE SHIFT, ADAPTIVE SYSTEMS, COHERENCE, ATMOSPHERIC DENSITY, DEPTH, FREQUENCY RESPONSE, GASES, HIGH POWER, JET FLOW, LASER BEAMS, LASER CAVITIES, LASERS, OPTICAL PROPERTIES, OPTICS, PATHS, POWER, PRISMS(OPTICS), REFRACTION, REFRACTIVE INDEX, WAVEFRONTS.

IDENTIFIERS: (U) \*High Energy Lasers, Adaptive Optics, PE61102F, WUAFOSR2307A1, COAT(Coherent Adaptive Optical Technique).



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OTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EV109K

AD A209 868 6/4 6/5 AD-A209 868 CONTINUED

MONTEFIORE HOSPITAL AND MEDICAL CENTER BRONX NY

YIELD.

(U) 24-Hour Mean Plasma Hormone Levels in Men with Coronary Heart Disease.

IDENTIFIERS: (U) PEG1102F, WUAF0SR2312A3, Androestrogene, Glucuronide, Estrone, Dehydroisandrosterone, Triiodothyronine.

DESCRIPTIVE NOTE: Final rept. 1 May 78-30 Apr 79.

JUL 79

PERSONAL AUTHORS: Zumoff, Barnett

CONTRACT NO F49620-78-C-0078

PROJECT NO 2312

TASK NO. A3

MONITOR: AF03R  
TR-89-0881

UNCLASSIFIED REPORT

ABSTRACT: (U) Effort has involved the plasma concentrations of 14 hormones in 10 rigorously selected younger men who have recovered well from a myocardial infarction, and in 34 suitable controls. Concentrations of 11 hormones were normal. Concentrations of 3 abnormal: estrone was elevated from the normal average, dehydroisandrosterone was elevated from normal, triiodothyronine was decreased from normal. All three of these abnormalities are in the direction of femaleness, i.e. women normally have higher levels of estrone and dehydroisandrosterone and lower levels of triiodothyronine than men. Two of the abnormalities, those of estrone and dehydroisandrosterone are also found in obese men. A 'discriminant' composed of all 3 of the individually abnormal hormones yields nearly total separation of the post-infarct group from normal controls; there is only 1 overlap. 24 Hour urine analyses were accomplished on 6 men with abnormal and 21 men with normal coronary arteriograms. Total androgen metabolites excretion was lower in the abnormal than in the normals, and the excretion of androsterone glucuronide was markedly low. Keywords: Hormones; Cardiac patients. (KT)

DESCRIPTORS: (U) \*CARDIAC PATIENTS, \*BLOOD PLASMA, HORMONES, \*MYOCARDIAL INFARCTION, ABNORMALITIES, CONTROL, ESTROGENS, MALES, CORONARY DISEASE, HEART, LOW LEVEL.

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DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVI09K

AD-A209 867

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AD-A209 866

11/6

## MISSOURI UNIV-COLUMBIA DEPT OF STATISTICS

(U) Nonparametric and Sequential Analysis of Life Testing and Reliability Problems.

DESCRIPTIVE NOTE: Final rept..

79

PERSONAL AUTHORS: Basu, Asit P.

CONTRACT NO. AFOSR-75-2795

PROJECT NO. 2304

TASK NO. A5

MONITOR: AFOSR  
TR-89-0882

## UNCLASSIFIED REPORT

ABSTRACT: (U) Contents: Classification and selection rules for the exponential populations; Nonparametric analysis of some reliability problems; Bayesian test for increasing failure rate; Estimation of the restricted scale parameter of the exponential distribution; Nonparametric tests for independence; Estimation of reliability in the stress-strength model; Estimates of reliability for k-out-of-m systems; Identifiability of the multinomial and other distributions under competing risks model. (kr)

DESCRIPTORS: (U) \*LIFE TESTS, \*NONPARAMETRIC STATISTICS, \*SEQUENTIAL ANALYSIS, BAYES THEOREM, DISTRIBUTION FUNCTIONS, ESTIMATES, EXPONENTIAL FUNCTIONS, FAILURE, PROBLEM SOLVING, LIMITATIONS, PARAMETERS, RATES, RELIABILITY, SCALE, SELECTION, TEST AND EVALUATION.

IDENTIFIERS: (U) PE61102F, WUAFOSR2304A5.

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## MICHIGAN TECHNOLOGICAL UNIV HOUGHTON DEPT OF METALLURGICAL ENGINEERING

(U) Fundamental Studies of B Phase Decomposition Modes in Titanium Alloys.

DESCRIPTIVE NOTE: Final rept. 1 Oct 78-30 Sep 79.

AUG 79

PERSONAL AUTHORS: Aaronson, H. I.; Scarr, G. K.; Plichta, M. R.; Moore, J. P.

CONTRACT NO. AFOSR-78-3728

PROJECT NO. 2306

TASK NO. A1

MONITOR: AFOSR  
TR-89-0884

## UNCLASSIFIED REPORT

ABSTRACT: (U) A technique has been developed for preparing thin foils of Ti-X specimens containing alpha, beta and intermetallic compound based upon ion milling performed in a cold stage without any intermediate electrothinning. Application of this technique to a Ti-6 W/0 Cr alloy reacted at 625 C yielded the following orientation relationships among the three phases. This result is in accord with a prediction of our theory of precipitation at interphase boundaries. A selected area electron channeling pattern study has been made of orientation relationships developed during the massive transformation in a Ag-26 A/0 Al alloy. (jes)

DESCRIPTORS: (U) \*INTERMETALLIC COMPOUNDS, BOUNDARIES, CHEMICAL MILLING, FOILS (MATERIALS), ION BEAMS, LOW TEMPERATURE, ORIENTATION (DIRECTION), PHASE STUDIES, PRECIPITATION, THINNESS, TITANIUM ALLOYS.

IDENTIFIERS: (U) PE61102F, WUAFOSR2306A1.

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DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EV109K

AD-A209 856

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AD-A209 856 CONTINUED

CITY COLL NEW YORK COMMUNICATIONS SYSTEMS LAB

TIME.

(U) Communications Using Channels Formed by Meteor Bursts.

IDENTIFIERS: (U) PE61102F, WUAFUSR2305B3.

DESCRIPTIVE NOTE: Final rept. 1 Jul 85-30 Nov 88.

NOV 88

PERSONAL AUTHORS: Schilling, Donald L.; Hibshoosh,  
Eliphaz

CONTRACT NO. AFOSR-85-0234

PROJECT NO. 2305

TASK NO. 83

MONITOR: AFOSR  
TR-89-0821

UNCLASSIFIED REPORT

ABSTRACT: (U) We propose to study the use of the meteor burst channel in communication systems by investigating the following important aspects: 1) The development and enhancement of an accurate and reliable channel model based on recently available empirical data. Analysis of this model results in analytical expressions for communication parameters such as channel duration and throughput to be used as design and analysis tools. 2) The optimization of throughput for fixed transmission rate under the constraint of a given maximum bit error rate. This will demonstrate the room for improvement in existing systems using constant transmission rate. 3) The feasibility of efficiently communicating over the MBC using variable bit rate and employing a feedback protocol to monitor the channel. This approach will dramatically improve the throughput in comparison with constant transmission rate systems. 4) Analysis of Automata Repeat-Request (ARQ) Transmission over MBC by studying performance measures such as duty cycle, throughput and waiting time as a function of packet length, coding, data rate and modulation technique. (rh)

DESCRIPTORS: (U) \*CHANNELS, \*COMMUNICATION AND RADIO SYSTEMS, \*DATA RATE, \*DATA TRANSMISSION SYSTEMS, ACCURACY, CODING, ERRORS, MATHEMATICAL ANALYSIS, MODELS, MODULATION, OPTIMIZATION, PARAMETERS, RATES, RELIABILITY, THROUGHPUT,

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CALIFORNIA UNIV SAN DIEGO LA JOLLA INST FOR COGNITIVE SCIENCE

ALGORITHMS, COMPUTERIZED SIMULATION, NETWORKS, NEURAL NETS, OPTICAL IMAGES, PROPAGATION, CEREBRAL CORTEX, VISUAL CORTEX.

(U) The Back Propagation Technique for Modeling Cortical Computation.

IDENTIFIERS: (U) PE61102F WUAFOSR2312A1, Parietal Lobe, Back Propagation Technique.

DESCRIPTIVE NOTE: Final rept. 1 Feb 18-1 Jan 89.

JAN 89

PERSONAL AUTHORS: Zipser, David

CONTRACT NO. AFOSR-86-0062

PROJECT NO. 2312

TASK NO. A1

MONITOR: AFOSR  
TF 89-0911

UNCLASSIFIED REPORT

ABSTRACT: (U) Over the past several years powerful learning procedures have been developed that can program simulated neural networks to compute a wide variety of functions. This has made it possible to use learning procedures to train model networks to do computations that occur in the brain. While there was so a priori reason to suppose that the individual neuro-like units in these model networks would resemble the brain in any way, the empirical observations is that they do. Good results have been achieved applying this paradigm to modeling monkey parietal area 7a. Various aspects of the primary visual area have also been successfully modeled using this approach. The results of this work raise the interesting possibility that learning procedures and particularly the back propagation algorithm used in these studies, can serve as a general technique to account for how the brain implements computations. While these observations do not imply that back propagation is actually used in the brain, they do raise the possibility that some analogous learning procedure is used there. Keywords: Mathematical models, Computerized simulation. (aw)

DESCRIPTORS: (U) \*BRAIN, \*COMPUTATIONS, \*LEARNING, \*MATHEMATICAL MODELS, \*ARTIFICIAL INTELLIGENCE.

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OPTICAL SOCIETY OF AMERICA WASHINGTON D C

IDENTIFIERS: (U) Four Wave Mixing, Multiphoton Spectroscopy, PEG1102F, WUAFOSR2301A1.

(U) Organization of the Topical Meeting on Short Wavelength Coherent Radiation: Generation and Applications (4th) Held in North Falmouth, Massachusetts

DESCRIPTIVE NOTE: Final rept. 1 Jun 88-1 Mar 89.

AR 89

PERSONAL AUTHORS: Quinn, Jarus W.

CONTRACT NO. AFOSR-88-0192

PROJECT NO. 2301

TASK NO. A1

MONITOR: AFOSR  
TR-89-0788

UNCLASSIFIED REPORT

ABSTRACT: (U) The meeting dealt with the development and application of sources of coherent radiation from the extreme ultraviolet to the x-ray spectral region. Closely related areas of interest are multiphoton phenomena, soft x-ray optics, and laser produced plasmas. Topics covered included: short-wavelength lasers, free electron lasers and undulators, harmonic generation and frequency conversion, short wavelength optics and novel instrumentation, laser plasma radiation sources, multiphoton phenomena, ultrafast short-wavelength sources, applications in spectroscopy, and microfabrication, phase coherent applications: holography and interferometry, and unique applications of short-wavelength sources. Keywords: Symposia; Abstracts. (JHD)

DESCRIPTORS: (U) \*COHERENT RADIATION, \*ULTRAVIOLET SPECTROSCOPY, \*X RAY SPECTROSCOPY, COHERENCE, FABRICATION, FREE ELECTRON LASERS, FREQUENCY CONVERSION, HARMONIC GENERATORS, HOLOGRAPHY, INTERFEROMETRY, LASER BEAMS, LASERS, MICROMINIATURIZATION, OPTICS, PHOTONS, SHORT PLASMAS (PHYSICS), RANGE (EXTRIMES), ABSTRACTS, SHORT PULSES, SHORT WAVELENGTHS, SOFT X RAYS, SOURCES, SPECTROSCOPY, SYMPOSIA, X RAY SPECTRA.

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NEW YORK UNIV N Y DEPT OF PSYCHOLOGY

UNIVERSITY OF SOUTHERN CALIFORNIA LOS ANGELES DEPT OF  
AEROSPACE ENGINEERING

(U) Higher Order Mechanisms of Color Vision.

DESCRIPTIVE NOTE: Progress rept. no. 1, 15 Sep 86-14 Mar  
89.

DESCRIPTIVE NOTE: Final rept. 1 Aug 85-31 Jan 89.

MAY 89

JUN 89

PERSONAL AUTHORS: Krauskopf, John

PERSONAL AUTHORS: Maxworthy, T.; Chen, H. K.

CONTRACT NO. AFOSR-86-0334

CONTRACT NO. AFOSR-85-0318

PROJECT NO. 2313

PROJECT NO. 2307

TASK NO. A5

TASK NO. A3

MONITOR: AFOSR

MONITOR: AFOSR  
TR-89-0931

TR-89-0933

## UNCLASSIFIED REPORT

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ABSTRACT: (U) The main accomplishments have been: 1) a comprehensive study of the effects of chromatic content, blur and contrast of targets on vernier acuity and on stereo acuity; 2) the use of a new method of measuring chromatic discrimination under conditions of constant adaptation; 3) continuation of the study of the chromatic properties of single cells in the monkey cortex; and 4) experiments on the significance of color in the perception of motion. keywords: Color Vision; Visual cortex; Visual acuity; Thresholds physiology; Adaptation physiology; Psychophysiology; Psychophysics; Color discrimination; Isoluminance. (edc)

DESCRIPTORS: (U) \*ADAPTATION(PHYSIOLOGY), \*COLOR VISION, CELLS(BIOLOGY), CHROMATICITY, COLORS, CONTRAST, DEPTH, DISCRIMINATION, LUMINANCE, MEASUREMENT, MONKEYS, MOTION, VISUAL PERCEPTION, PSYCHOPHYSICS, PSYCHOPHYSIOLOGY, SPACE PERCEPTION, THRESHOLDS(PHYSIOLOGY), VISUAL ACUITY, VISUAL CORTEX.

IDENTIFIERS: (U) Isoluminance. PEG1102F. WUAFOSR2313A5.

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PRINCETON UNIV NJ DEPT OF ELECTRICAL ENGINEERING AND  
COMPUTER SCIENCE

BAYLOR COLL OF MEDICINE HOUSTON TX

(U) Transport and Submillimeter Wave Spectroscopy of GaAs/  
Al sub xGa sub 1-x and In sub x Ga sub 1-x As  
Heterostructures.

(U) Heterosynaptic Modulation of Long-Term Potentiation at  
Mossy Fiber Synapses in Hippocampus.

DESCRIPTIVE NOTE: Final rept. Jul 85-Sep 88,

DESCRIPTIVE NOTE: Annual technical rept. 1 Apr 88-31 Mar  
89.

JUN 89

MAY 89

PERSONAL AUTHORS: Tsui, D. C.

PERSONAL AUTHORS: Johnson, Daniel

CONTRACT NO. AFOSR-85-0204

CONTRACT NO. AFOSR-88-0142

PROJECT NO. 2305

MONITOR: AFOSR  
TR-89-0935

TASK NO. C1

UNCLASSIFIED REPORT

MONITOR: AFOSR  
TR-89-0934

UNCLASSIFIED REPORT

ABSTRACT: (U) The research emphasizes the physics of the  
electronic processes in GaAs/Al(x)Ga(1-x)As and In(x)Ga(1-  
x)As/InP heterojunction thin film structures and focuses  
in two directions: one in superlattice materials and the  
other in submillimeter wave spectroscopy. After a brief  
description is given of the accomplishments in both  
directions, together with a list of the publications of  
work supported by the contract, a detailed account is  
made of the systematic investigation of transport through  
In(x)Ga(1-x)As/InP superlattices grown by Chemical Beam  
Epitaxy. Keywords: Gallium arsenides; Aluminum gallium  
arsenides; Indium compounds; Indium phosphides. (AW)

DESCRIPTORS: (U) \*ALUMINUM GALLIUM ARSENIDES, \*GALLIUM  
ARSENIDES, \*HETEROJUNCTIONS, \*INDIUM COMPOUNDS, \*THIN  
FILMS, CHEMICALS, CRYSTAL LATTICES, ELECTRONIC STATES,  
EPITAXIAL GROWTH, INDIUM PHOSPHIDES, PHYSICS,  
SPECTROSCOPY, SUBMILLIMETER WAVES, SUPERLATTICES,  
TRANSPORT.

IDENTIFIERS: (U) PE61102F, WUAFOSR2305C1.

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ABSTRACT: (U) The overall goal of this research project  
is to investigate the cellular mechanisms associated with  
the heterosynaptic modulation of long-term synaptic  
potentiation (LTP) at mossy fiber synapses in hippocampus.  
It was previously shown that norepinephrine, through Beta-  
adrenoceptors, enhances the magnitude, duration, and  
probability of induction of mossy fiber LTP, while  
acetylcholine, through muscarinic receptors, depresses  
the magnitude and probability of induction of mossy fiber  
LTP. The goal for the first year of this research project  
was to test several specific hypotheses for the  
cholinergic and entry through voltage-gated calcium  
channels for the induction of LTP. We have also been  
investigating the properties of voltage-ated calcium  
channels in hippocampal CA3 neurons and the modulation of  
these calcium channels by noradrenergic and cholinergic  
agonists. These studies have used acutely exposed  
hippocampal neurons and a new preparation of isolated  
mossy fiber presynaptic terminals. In a collaborative  
project with Dr. David Terrian at the USAFSAM, San  
Antonio, the mechanisms of neurotransmitter release from  
a homogeneous fraction of mossy fiber synaptosomes have  
been investigated. (AW)

DESCRIPTORS: (U) \*HIPPOCAMPUS, \*NERVE TRANSMISSION,  
\*NERVE FIBERS, \*SYNAPSE, ACETYLCHOLINE, CALCIUM CHANNELS,  
CYTOLOGY, EXPOSURE(GENERAL), HYPOTHESES, LONG RANGE(TIME),  
MODULATION, MUSCARINE, NERVE CELLS, NOREPINEPHRINE,  
PREPARATION, RECEPTION, RELEASE, IONIC CURRENT.

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CHOLINERGIC NERVES.

COLORADO STATE UNIV FORT COLLINS

IDENTIFIERS: (U) \*Long Term Synaptic Potentiation,  
LTP(Long Term Potentiation), \*Mossy Fiber Synapses,  
Calcium Channels, Noradrenergic Agonists, Cholinergic  
Agonists.

(U) The Phototoxicity of Blue Light on the Functional  
Properties of the Retinal Pigment Epithelium.

DESCRIPTIVE NOTE: Annual rept. 1 May 88-30 Apr 89.

MAY 89

PERSONAL AUTHORS: Paulter,

CONTRACT NO. AFOSR-87-0189

PROJECT NO. 2312

TASK NO. A5

MONITOR: AFOSR  
TR-89-0930

UNCLASSIFIED REPORT

ABSTRACT: (U) The phototoxic effect of blue light on isolated pigment epithelium will be investigated. The emphasis will be on functional changes rather than a description of pathology. The pigment epithelium is analogous to the blood-brain barrier; therefore, the principal functions to be investigated are the integrity of the barrier system and the transport system and the transport systems known to operate in the pigment epithelium. The effects of blue light on leucine transport across the isolated bovine retinal pigment epithelium (RPE) have been continued to determine if Vitamin E and malatonin provided any protective action. Similar studies on the transport of glutamate in the retina to choroid direction were also completed. Keywords: Exposure physiology; Radiation effects; Response biology. (Kt)

DESCRIPTORS: (U) \*EPITHELIUM, \*LIGHT, \*PIGMENTS,  
\*TOXICITY, BARRIERS, BLOOD, BLUE(COLOR), BRAIN, CHOROID  
PLEXUS, EXPOSURE(PHYSIOLOGY), FUNCTIONAL ANALYSIS,  
PHYSIOLOGICAL EFFECTS, GLUTAMIC ACID, ISOLATION, LEUCINE,  
PATHOLOGY, RADIATION EFFECTS, RESPONSE(BIOLOGY), RETINA,  
SALTS, TRANSPORT, VITAMIN E.

IDENTIFIERS: (U) PE61102F, WUAFOSR2312A5, \*Phototoxicity

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PITTSBURGH UNIV PA SURFACE SCIENCE CENTER

STANFORD UNIV CA DIV OF APPLIED MECHANICS

(U) The Orientation of Chemical Bonds at Surfaces: A Key to Understanding the Structure and Bonding of Surface Species.

(U) Mechanical Response of Structural Elements to Dynamic Loads.

DESCRIPTIVE NOTE: Final rept. 15 Apr 86-14 Apr 89.

DESCRIPTIVE NOTE: Final rept. 1 Sep 77-31 Dec 78.

JUN 89

JAN 89

PERSONAL AUTHORS: Yates, John T., Jr

PERSONAL AUTHORS: Herrmann, George

CONTRACT NO. AFOSR-86-0107

CONTRACT NO AFOSR-77-3403

PROJECT NO. 2303

PROJECT NO. 2307

TASK NO. A2

TASK NO. B1

MONITOR: AFOSR  
TR-89-0928

MONITOR: AFOSR  
TR-89-0956

## UNCLASSIFIED REPORT

## UNCLASSIFIED REPORT

ABSTRACT: (U) This work has been concerned with the development and use of the digital ESDIAD method for studying the molecular structure and the dynamics of adsorbates on metal single crystal surfaces. A number of new findings have been made involving the following phenomena: (A) First direct observation of the hindered rotation of a chemisorbed molecule; (B) Observation of hydrogen bonding forces between adsorbates causing hindrance of molecular rotation; (C) Structural determination of bonding site for coordinatively unsaturated radical species, PF<sub>2</sub> and PF on Ni(111). (D) Discovery of alkali metal sensitization of H<sub>2</sub> ESD yield on metals; (E) Discovery of copious metastable CO yield in ESD from CO on Pt(111). (jes)

DESCRIPTORS: (U) \*SINGLE CRYSTALS, ALKALI METALS, BONDING, CHEMICAL BONDS, DETERMINATION, DYNAMICS, METAL CRYSTALS, METALS, MOLECULAR ROTATION, MOLECULAR STRUCTURE, OBSERVATION, SENSITIZING, SITES, STRUCTURAL PROPERTIES, SURFACES, YIELD.

IDENTIFIERS: (U) PE61102F, WUAFOSR2303A2.

IDENTIFIERS: (U) PE61102F, WUAFOSR2307B1.

ABSTRACT: (U) The general objectives of the activities under this grant consisted of acquiring more detailed and complete knowledge of dynamic response of laminated composites. Specifically, wave propagation in a periodically layered elastic body in plane strain was studied and a considerable amount of numerical results were worked out. Both real and complex branches of the dispersion spectrum were considered. The spectrum was shown to be multivalued and quite intricate in detail. Some analytical properties of the Floquet surface were also established. An analytical study of a plane wave in plane strain is exceedingly involved due to the coupling between longitudinal and shear waves. (jes)

DESCRIPTORS: (U) \*COMPOSITE MATERIALS, DISPERSING, DYNAMIC LOADS, DYNAMIC RESPONSE, ELASTIC PROPERTIES, ELASTIC WAVES, LAMINATES, LAYERS, MECHANICAL PROPERTIES, NUMERICAL ANALYSIS, PLANE WAVES, RESPONSE, SHEAR PROPERTIES, SPECTRA, STRUCTURAL COMPONENTS, WAVE PROPAGATION.

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RUTGERS - THE STATE UNIV NEW BRUNSWICK N J DEPT OF  
PSYCHOLOGY

IDENTIFIERS. (U) PE61102F, WUAFOSR2313A5.

(U) Eye Movements and Visual Information Processing.

DESCRIPTIVE NOTE: Interim rept. 1 Apr 88-31 Mar 89.

APR 89

PERSONAL AUTHORS: Kowler, Eileen

CONTRACT NO. AFOSR-88-0171

PROJECT NO. 2313

TASK NO. A5

MONITOR: AFOSR  
TR-89-0808

UNCLASSIFIED REPORT

ABSTRACT: (U) Eye movements place a limit on the processing of visual information because they determine the location and the velocity of the retinal image. Thus, to understand how we see it is necessary to understand how eye moments are controlled. Work this year in my laboratory has concentrated on the roles of expectations and selective attention in the programming of smooth and saccadic eye movements. We have: 1) demonstrated distinct roles for past experience and expectations in the control of smooth eye movement and found that expectation will predominate in the presence of cues about the direction of future motion; 2) found that brisk initial pursuit requires that expectation that target motion will continue; 3) showed that saccadic eye movements are not attracted to visual backgrounds (as had been claimed) unless subjects pay attention to the background. These studies show that central representations of visual scenes, containing information about the position, motion and future motion of selected objects, are the natural effective stimulus for human eye movement. Psychomotor tests, Psychology; Communication; Eye movement. (JES)

DESCRIPTORS: (U) \*EYE MOVEMENTS, \*PSYCHOMOTOR TESTS, ATTENTION, EYE, HUMANS, IMAGES, INFORMATION PROCESSING, MOVING TARGETS, OPTICAL IMAGES, PSYCHOLOGY, RETINA, SALARIES, VISUAL SIGNALS.

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UNIVERSAL ENERGY SYSTEMS INC DAYTON OH

(U) United States Air Force Research Initiation Program  
for 1987 Volume 4.

AD-A209 729 CONTINUED

the Detection of the Protozoan Parasite Giardia Lamblia  
in Drinking Water; Limitations to Heavy Work of Personnel  
Wearing at 21 C: U.S. Military Chemical Defense Ensemble.  
(JHD)

DESCRIPTIVE NOTE: Interim rept..

APR 89

PERSONAL AUTHORS: Darrah, Rodney C.

CONTRACT NO. F49620-85-C-0013

PROJECT NO. 3396

TASK NO. D5

MONITOR: AFOSR  
TR-89-0832

DESCRIPTORS: (U) \*AIR FORCE RESEARCH, ADAPTIVE FILTERS,  
ASSAYING, BEHAVIOR, BIAS, BONES, BRAIN, CHEMICAL WARFARE,  
COMPARISON, CONTRAST, DATA BASES, AVIATION FUELS, DEFENSE  
SYSTEMS, DETECTION, DRINKING WATER, FOURIER ANALYSIS,  
GROWTH(GENERAL), HYDROCARBONS, IMPACT, IMPLANTATION,  
INFORMATION SYSTEMS, INTEGRATED SYSTEMS, LEARNING,  
MACROMOLECULES, MAINTENANCE, MATHEMATICAL MODELS,  
MEASUREMENT, METALS, MULTIPURPOSE, MUTAGENS, PERCEPTION,  
PHYTOXICITY, POTENTIAL THEORY, RATS, RESIDUES,  
SENSITIVITY, SOILS, STRUCTURAL PROPERTIES, SUPERVISORS,  
SYNTHESIS, VOLATILITY.

IDENTIFIERS: (U) PEG1102F, WUAFOSR3396D5, Bonn Growth,  
JP-4 Fuel, Gasproff clothing.

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: See also Volume 1, AD-A209 726.

ABSTRACT: (U) Contents: Development of Implantable  
Devices for Sustained Delivery of Volatile Hydrocarbons  
in Rats; In Situ Detection of Osteoprogenitor Cells in an  
Actively Growing Bone System; Trauma-Activated Periosteum  
Derived Osteogenic Cells; Response to Selected Growth  
Factors; Assessing the Attributes of Expert Judgement;  
Measuring Bias in Subjective Uncertainty Estimates;  
Mathematical Modeling; Learning Behavior of Adaptive  
Filters for Evoked Brain Potentials; The Rhetoric of  
Hypertext; An Examination of Document Database Concepts  
and The Integrated Maintenance Information System;  
Structural Representations of Multi-Dimensional Criterion  
Construct Space; Comparison of Supervisor's and  
Incumbent's Estimates of SDy; The Role of Fourier  
Descriptions for Shape in Visual Form Perception;  
Comprehensibility of Technical Text; Mechanisms of  
Contrast and Lightness Constancy; Phytotoxicity of Soil  
Residues of JP-4 Aviation Fuel; An Impact Study for the  
Contracting Out of In-House Analytical Services at the  
Usaf Occupational & Environmental Health Laboratory-  
Brooks AFB, San Antonio, Texas; Effects of Metal Mutagens  
on the Synthesis and Accumulation of Macromolecules;  
Development of a Rapid and Sensitive Assay Procedure for

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## UNIVERSAL ENERGY SYSTEMS INC DAYTON OH

(U) United States Air Force Research Initiation Program  
for 1987. Volume 3.

DESCRIPTIVE NOTE: Interim rept.

APR 89

PERSONAL AUTHORS: Darrah, Rodney C.

CONTRACT NO. F49620-85-C-0013

PROJECT NO. 3396

TASK NO. D5

MONITOR. AFOSR  
TR-89-0831

## UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: See also Volume 4, AD-A209 729.

ABSTRACT: (U) Contents: A Numerical Study of the Flow Field and Heat Transfer in a Rectangular Passage with a Turbulator; Analysis of an Algorithm for Multiple Frequency Resolution; Signal Processing in EW Environment; Implementation of Blackboard Systems in Ada; Surface States and Electron Transport Properties in Semi-Insulating Gallium Arsenide; Investigate Feasibility of Implementing Associative Memories Using Luminescent Rebroadcasting Devices; Automated Translation of Digital Logic Equation into Optimized VHDL Code; Analytical Model and Computer Program of F-16 Nose Gear and F-16 ALGS; Development of a Technique for Prediction of Internal Heat Transfer in Actively Cooled Structures; Radiation Hypersonic Aerodynamics; A Chemical Kinetics Model for Mach 5-14 Hypersonic Flow; Development of a Microcomputer Lateral Resupply Simulation System; Development of Expert System Control of a Carbon Fiber Production Process; Influence of Microstructural Variations on the Thermomechanical Processing in Dynamic Material Modeling of Titanium Aluminides; Studies on the Compatibility of Potential Matrix and Reinforcement Materials in Ceramic Composites for High Temperature Aerospace Applications; Synthesis of Compounds Capable of

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Intramolecular Cyclization - Aromatization Reactions; Leaky Rayleigh and Lamb Waves on Composites; and Performance Improvement in Knowledge-Based Process Control Systems. (JHD)

DESCRIPTORS: (U) \*AIR FORCE RESEARCH, AERODYNAMICS, AEROSPACE SYSTEMS, ALGORITHMS, CARBON FIBERS, CERAMIC MATERIALS, COMPOSITE MATERIALS, COMPUTER PROGRAMS, CONTROL, CONTROL SYSTEMS, COOLING, DIGITAL SYSTEMS, DYNAMICS, ELECTRON TRANSPORT, EQUATIONS, FLOW FIELDS, FLOW, INSULATION, INTERNAL, LOGIC, MACHINE TRANSLATION, MATERIALS, MATHEMATICAL MODELS, MICROSTRUCTURE, MODELS, NUMERICAL ANALYSIS, PRODUCTION, REACTION KINETICS, REINFORCING MATERIALS, RESOLUTION, SIGNAL PROCESSING, STRUCTURES, SURFACE PROPERTIES, SYNTHESIS, THERMOMECHANICS, TITANIUM ALUMINIDE, TRANSPORT PROPERTIES, VARIATIONS.

IDENTIFIERS: (U) Expert Systems, Lamb Waves, Rayleigh Waves, PEG1102F, WUAFOSR3396D5.

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UNIVERSAL ENERGY SYSTEMS INC DAYTON OH

(U) United States Air Force Research Initiation Program  
for 1987. Volume 2.

DESCRIPTIVE NOTE: Interim rept..

APR 89

PERSONAL AUTHORS: Darrah, Rodney C.

CONTRACT NO. F49620-85-C-0013

PROJECT NO. 3396

TASK NO. D5

MONITOR: AFOSR  
TR-89-0830

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: See also Volume 3, AD-A209 728.

ABSTRACT: (U) Contents: The Omnidirectional Torquer -  
Experimental Prototype Model I; Calculation of Nonlinear  
Optical Properties; Modeling and Prediction in a  
Nonlocal Turbulence Model; CD2 (001) Vibrational  
Temperatures and Limb-View Infrared Radiance Under  
Terminator Conditions in the 60-100 Altitude Range;  
Comparison of SSM/I Rainrates and Surface Winds with the  
Corresponding Conventional Data in the North West Pacific  
Typhoons; Development of a System for the Measurement of  
Electron Excitation Cross Sections of Atoms and Molecules  
in the Near Infrared; Superconductor Testing; A Form and  
Function Knowledge Representation for Reasoning about  
Classes and Instances of Objects; Development and  
Evaluation of a Bayesian Test for System Testability;  
Crystalline Silicon Electro-Optic Waveguides;  
Measurements of a Slot Antenna Fed by Coplanar Waveguide  
and Solution of an Infinite Phased Array of Slots Fed by  
Coplanar Waveguide Over a Dielectric Half-Space; A New  
Measure of Maintainability/Reliability and Its Estimation;  
Signed-Digit Number System for Optical Adaptive  
Processing; Implementation of Iterative Algorithms for an  
Optical Signal Processor; Experimental Evaluation of  
Imaging Correlography; Interaction of Lasers with

Superconductors; and Three Dimensional Thermal Conduction  
Effects in High Power CW Laser Target Plates. (JHD)

DESCRIPTORS: (U) 'AIR FORCE RESEARCH, ADAPTIVE SYSTEMS,  
ALGORITHMS, ATOMS, BAYES THEOREM, CROSS SECTIONS,  
CRYSTALS, ELECTRONS, ELECTROOPTICS, EXCITATION, GROUND  
LEVEL, INTERACTIONS, ITERATIONS, CONTINUOUS WAVE LASERS,  
MAINTAINABILITY, MODELS, NEAR INFRARED RADIATION,  
NONLINEAR SYSTEMS, OMNIDIRECTIONAL, OPTICAL PROCESSING,  
CARBON DIOXIDE, OPTICAL PROPERTIES, NORTH PACIFIC OCEAN,  
PHASED ARRAYS, PLANAR STRUCTURES, PROTOTYPES, REASONING,  
RELIABILITY, SIGNAL PROCESSING, SILECON, SLOT ANTENNAS,  
SUPERCONDUCTORS, TEMPERATURE, TEST AND EVALUATION, TORQUE,  
TURBULENCE, TYPHOONS, MOLECULAR VIBRATION, WAVEGUIDES,  
WIND.

IDENTIFIERS: (U) PE61102F, WUAFOSR339605.

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## UNIVERSAL ENERGY SYSTEMS INC DAYTON OH

Soil Organic Matter; A Study of Semihardened Concrete Arch Structure Response Under Protective Layers; and Stress Wave Propagation in Layered Media. (JHD)

(U) United States Air Force Research Initiation Program for 1987. Volume 1.

DESCRIPTIVE NOTE: Interim rept..

APR 89

PERSONAL AUTHORS: Darrah, Rodney C.

CONTRACT NO. F49620-85-C-0013

PROJECT NO. 3396

TASK NO. D5

MONITOR: AFOSR  
TR-89-0329

DESCRIPTORS: (U) \*AIR FORCE RESEARCH, AERODYNAMIC CHARACTERISTICS, ATTENUATION, AUTOCORRELATION, BONES, BOUNDARIES, COMBUSTORS, CRACK PROPAGATION, CYLINDRICAL BODIES, DAMAGE, DETECTION, EDGES, ELASTIC PROPERTIES, ENERGETIC PROPERTIES, ESTIMATES, FILM COOLING, FLAMMABILITY, FRAGMENTS, FREE FLIGHT, FUEL INJECTION, GAS GUNS, HYBRID SYSTEMS, IGNITION, IMAGES, LEGS, LIQUID COOLING, MEDIA, MOLECULAR STRUCTURE, MULTIMODE, NITROGEN COMPOUNDS, NONLINEAR SYSTEMS, NUMERICAL ANALYSIS, ORGANIC MATERIALS, ORGANIC SOLUTES, ORGANOMETALLIC COMPOUNDS, PATTERN RECOGNITION, PHYSICAL PROPERTIES, PLASTIC PROPERTIES, POWER SPECTRA, PRESSURE, PROTECTIVE COATINGS, PYROELECTRICITY, REPAIR, ROCKET ENGINES, SAMPLING, SLENDER BODIES, SOILS, SOLID PROPELLANTS, SOLUBILITY, STRESS ANALYSIS, STRESS WAVES, TEMPERATURE, SUPERSONIC COMBUSTION.

## UNCLASSIFIED REPORT

IDENTIFIERS: (U) Aqueous Solutions, PE61102F,  
WUAFOSR339605.

SUPPLEMENTARY NOTE: See also Volume 2, AD-A209 727.

ABSTRACT: (U) Contents: Effects of Bending Flexibility on the Aerodynamic Characteristics of Slender Cylinders Determined from Free-Flight Ballistic Data; Image Complexity Measures and Edge Detection; Advanced Gun Gas Diversion; A Physical and Numerical Study of Pressure Attenuation in Solids; Pyroelectric Sensing for Potential Multi-Mode Use; Gaseous Fuel Injection and Mixing in a Supersonic Combustor; systems Effectiveness for Targets with Repair or Replacement; A Pattern Recognition Application in Elastic-Plastic Boundary Element, Hybrid Stress Analysis; Vectorized Perturbed Functional Iterative Scheme (VPFIS): A Large-Scale Nonlinear System Solver; Liquid Film Cooling in Rocket Engines; Estimation of Autocorrelation and Power Spectral Density for Randomly Sampled Systems; Fracture in Solid Propellant: Damage Effects upon Crack Propagation; Novel Conversion of Organometallics to Energetic Nitro Compounds; Correlations of Spontaneous Ignition Temperatures with Molecular Structures of Flammable Compounds; The Estimation of Structure from Fragments of the Femur: A Revision of the Steele Method; Effects of Water Solubility and Functional Group Content on the Interactions of Organic Solutes with

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FLORIDA AGRICULTURAL AND MECHANICAL UNIV TALLAHASSEE  
DEPT OF PHYSICS

(U) Analytical Evaluation of the Electrostatic Potential  
for Diatomic Molecules.

88

DESCRIPTORS: (U) \*DIATOMIC MOLECULES, ACCURACY,  
CANCELLATION, COMPUTATIONS, COMPUTER APPLICATIONS, CROSS  
SECTIONS, ELECTROSTATICS, ERRORS, EXPONENTIAL FUNCTIONS,  
HYDROGEN, INTEGRALS, MATHEMATICAL ANALYSIS, MOLECULES,  
NUMERICAL ANALYSIS, REPRINTS, TAYLORS SERIES, TEST AND  
EVALUATION, WAVES.

PERSONAL AUTHORS: Jones, H. W.; Etemadi, B.; Weatherford,  
C. A.

IDENTIFIERS: (U) WUAFDSR2303B3, PE61102F.

CONTRACT NO. AFOSR-88-0149

PROJECT NO. 2303

TASK NO. 83

MONITOR: AFOSR  
TR-89-0785

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in International Jnl. of Quantum  
Chemistry: Quantum Chemistry Symposium (22nd) p497-502  
1988.

ABSTRACT: (U) The technique of expanding Lowdin alpha-  
functions in a Taylor series has been further developed  
and applied to the problem of the electrostatic potential  
due to H2 with given 1s, 2s, 2p Slater-type orbitals. In  
contrast to other methods, our approach is completely  
analytic and capable of arbitrary precision. The  
ultimate accuracy of our method is dependent upon the  
number of partial waves used; here by use of only 13  
harmonics excellent results are achieved. Our methods are  
readily generalized to larger molecules. The electron-  
molecule static interaction potentials is of central  
importance to calculations of cross sections for electron-  
molecule collisions. In this paper, using the diatomic  
hydrogen molecule of Fraga and Ransil, we introduce a  
fully analytic method and make a few comparisons with  
computer runs using the codes of Morrison and Schmid et  
al. They, as well as others, need numerical integrals for  
the potential. Our analytical methods avoid cancellation  
errors and singularities by expanding the exponentials in  
the Lowdin alpha-functions, which are used to represent  
displaced orbitals in a spherical harmonic series.  
Reprints. (jes)

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3500-4000 K can be reached with reasonable solar concentration ratios. (rh)

PENNSYLVANIA STATE UNIV UNIVERSITY PARK DEPT OF  
MECHANICAL ENGINEERING

(U) Coupling between Radiation and Gas Dynamics.

DESCRIPTIVE NOTE: Final rept. 1 Feb 88-1 Feb 89.

MAY 89

PERSONAL AUTHORS: Merkle, Charles L.; Micci, Michael M.

CONTRACT NO. AFOSR-84-0048

PROJECT NO. 2308

TASK NO. A1

MONITOR: AFOSR  
TR-89-0784

UNCLASSIFIED REPORT

ABSTRACT: (U) Heat addition in flowing gases by electromagnetic wave absorption is being considered for propulsive purposes. The research includes both microwave and solar radiation. In the microwave studies, an experimental investigation of helium and nitrogen discharges has shown that free-floating plasmas can be established in either medium for a range of input powers and gas flow rates, although helium gives the broader range of stable limits. The discharges are being set up in a 10.2 cm quartz sphere. For pressure ranges from 0.5 to 5.0 atm and input powers to 3 kW, maximum coupling efficiencies are measured to be between 40 and 65% with higher efficiencies for cases with larger flow rates. Spectroscopic techniques are being introduced to provide detailed local measurements of conditions inside the discharge. In companion analytical efforts, computational techniques are being used to model the experimental flowfields to provide improved understanding of the absorption process and to enable us to extend the experimental findings to broader conditions. In the solar radiation studies, the feasibility of direct absorption of solar energy in flowing conditions is studied. Similar computational studies are also being used to study the absorption of solar radiation in hydrogen with alkali seedants. Results show peak gas temperatures of about

DESCRIPTORS: (U) \*COUPLING(INTERACTION), \*ELECTROMAGNETIC RADIATION, \*FLOW FIELDS, \*GAS DYNAMICS, \*HELIUM, \*HYDROGEN, \*NITROGEN, \*PLASMAS(PHYSICS), \*RADIATION ABSORPTION, \*SOLAR ENERGY, \*SOLAR RADIATION, \*SPECTROSCOPY, ABSORPTION, ADDITION, COMPUTATIONS, EFFICIENCY, FLOATING BODIES, FLOW RATE, GAS FLOW, GASES, HEAT, LIMITATIONS, MEASUREMENT, MICROWAVES, PEAK VALUES, STABILITY, TEMPERATURE.

IDENTIFIERS: (U) PE61102F, WUAFOSR2308A1.

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CINCINNATI UNIV OH DEPT OF CHEMISTRY

U) Generate Reinforcing Particles in Place.

IDENTIFIERS: (U) PEG1102F, WUAFOSR2303A3.

89

PERSONAL AUTHORS: Mark, James E.

CONTRACT NO. AFOSR-83-0027, DAAL03-86-K-0032

PROJECT NO. 2303

TASK NO. A3

MONITOR: AFOSR, ARO  
TR-89-0789, 23255.24-MS

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. In Chemtech, v19 p230-233 Apr 89.

**ABSTRACT:** (U) When the hydrolysis reactions used in the sol-gel process are carried out within a polymeric matrix, the silica is generated in the form of small, well-dispersed particles. When the matrix is an elastomer, these particles provide the same highly desirable reinforcing effects obtained by the usual blending of a filler (such as carbon black) into polymers (such as natural rubber) prior to their being cross-linked or cured into tough elastomers of commercial importance. Previous studies have concentrated on the elastomer reinforcement that the particles provide, but the focus can easily be switched to the particles themselves. Thus the elastomeric matrix can be viewed as acting in the same way as the frozen low molecular weight matrices that are used to immobilize and stabilize molecular fragments and thus permit their spectroscopic characterization. Characterization of the dispersed ceramic particles could provide information that would complement that obtained from the possibly more complicated monolithic ceramic objects of primary interest in the sol-gel technology. Reprints. (AW)

**DESCRIPTORS:** (U) \*ELASTOMERS, \*REINFORCING MATERIALS, \*SILICON DIOXIDE, \*CERAMIC FIBERS, CARBON BLACK, CERAMIC MATERIALS, DISPERSING, FRAGMENTS, HYDROLYSIS, MOLECULES, NATURAL RUBBER, PARTICLES, POLYMERS, REPRINTS, SWITCHING, TOUGHNESS, FIBER REINFORCEMENT.

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AD-A209 653 CONTINUED

MASSACHUSETTS INST OF TECH CAMBRIDGE RESEARCH LAB OF ELECTRONICS

(U) Microwave Emission from Relativistic Electron Beams.

DESCRIPTIVE NOTE: Final rept. 1 Nov 83-31 Oct 88.

MAR 89

PERSONAL AUTHORS: Bekefi, George

CONTRACT NO. AFOSR-84-0026

PROJECT NO. 2301

TASK NO. A8

MONITOR: AFOSR  
TR-89-0787

UNCLASSIFIED REPORT

ABSTRACT: (U) Profile modification by optical guiding in a Raman free electron laser operating at microwave frequencies was studied experimentally. A cyclotron autoresonance maser (CARM) amplifier was designed, built, and tested. This CARM operates at 35 GHz with a power output of 10 MW and an efficiency of three percent. Observations of Field Profile Modifications in a Raman Free Electron Laser Amplifier: We report measurements of the spatial distribution of the RF electric field intensities and phases induced in a free electron laser amplifier operating in the collective (Raman) regime. The studies are carried out at a microwave frequency of about 10 GHz in a FEL using a mildly relativistic electron beam of about 200 keV energy and 1 - 4 A current. The probing of the ponderomotive (space charge) and the electromagnetic waves is accomplished by means of small movable electric dipole antennas inserted into the interaction region. A 35 GHz Cyclotron Autoresonance Maser Amplifier: Studies of a cyclotron autoresonance maser are presented. The measurements are carried out at a frequency of 35 GHz using a mildly relativistic electron beam (1.5 MeV, 260 A) generated by a field emission electron gun followed by an emittance selector that removes the outer, hot electrons. Perpendicular energy is imparted to the electrons by means of a bifilar helical wiggler. Measurements give a small signal gain of

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DESCRIPTORS: (U) \*MICROWAVE AMPLIFIERS, \*MASERS, \*FREE ELECTRON LASERS, COMPUTERIZED SIMULATION, EFFICIENCY, ELECTRIC FIELDS, ELECTROMAGNETIC RADIATION, ELECTRON BEAMS, ELECTRON GUNS, ELECTRONICS, EMISSION, ENERGY, CYCLOTRON RESONANCE, FIELD EMISSION, GAIN, INTENSITY, INTERACTIONS, LASER AMPLIFIERS, MEASUREMENT, MICROWAVE FREQUENCY, MICROWAVES, MODIFICATION, OUTPUT, POWER, RAMAN SPECTROSCOPY, RELATIVITY THEORY, REPORTS, SATURATION, SIGNALS, SPACE CHARGE, SPATIAL DISTRIBUTION, SPIN FLIP LASERS.

IDENTIFIERS: (U) PEG1102F, WUAFOSR2301A8.

90 dB/m and a saturated power output of 10 MW. The corresponding electronic efficiency is 3%. Computer simulations are also presented. (Jhd)

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AD-A209 649 12/7 12/3

UNIVERSITY OF SOUTHERN CALIFORNIA LOS ANGELES DEPT OF  
ELECTRICAL ENGINEERING

(U) Basic Research in Reliability for Real Systems.

DESCRIPTIVE NOTE: Final technical rept. 15 Jul 86-14 Jul  
88.

AUG 88

PERSONAL AUTHORS: Li, Victor O.

CONTRACT NO. AFOSR-84-0269

PROJECT NO. 2304

TASK NO. K3

MONITOR: AFOSR  
TR-89-0783

UNCLASSIFIED REPORT

ABSTRACT: (U) The goal of this research is to develop practical models and efficient algorithms to analyze the reliability/availability/maintainability of complex systems in which component failures are statistically dependent and each component is subject to degradations before complete failure. The Event-Based Reliability Model (EBRM) was developed to model and analyze the reliability of a network in which component failures are statistically dependent. In EBRM, the events that could cause component failures were modeled explicitly. This approach required much less parameters than the traditional model employing conditional probabilities. The EBRM was also proved to be a completely general model which could be applied to various types of failure dependencies. For reliability evaluations, many existing algorithms for computing network reliability could be used with minor modifications and no significant increase in computational complexity. An improved algorithm for the approximate evaluation of network performance was also developed. For multi-state systems, ordered enumeration was used to approximate and bound system reliabilities and other performance measures, and an efficient algorithm was developed for this purpose. The author has been studying network management algorithms which are resilient to network failures. (kr)

DESCRIPTORS: (U) \*NETWORK ANALYSIS(MANAGEMENT), \*SYSTEMS ANALYSIS, \*STATISTICAL ANALYSIS, ALGORITHMS, AVAILABILITY, COMPUTATIONS, DEGRADATION, EFFICIENCY, FAILURE, MAINTAINABILITY, MANAGEMENT, MODELS, MULTIMODE, RELIABILITY, TEST AND EVALUATION, RESEARCH MANAGEMENT.

IDENTIFIERS: (U) PE61102F, WUAFOSR2304K3, E3RM(Event Based Reliability Model).

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DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EV109K

AD-A209 633 CONTINUED

CINCINNATI UNIV OH DEPT OF CHEMISTRY

(U) Molecular Theories of Rubberlike Elasticity and Some Recent Results on Model Networks and Unusual Fillers.

89

PERSONAL AUTHORS: Mark, J. E.

CONTRACT NO. AFOSR-83-0027

PROJECT NO. 2303

TASK NO. A3

MONITOR: AFOSR  
TR-89-0790

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Kautschuk and Gummi, v42 n3  
p191-193 1989.

ABSTRACT: (U) The molecular theories of rubberlike elasticity are reviewed briefly; they are based on two assumptions, viz. that intermolecular interactions are independent of deformation and that the Helmholtz free energy of a network is separable into a non-elastic and an elastic part, with only the latter depending on deformation. With regard to two important examples, the phantom theory predicts moduli that are lower than those of the affine theories; in both cases the modulus should be a constant independent of deformation which is generally not found to be the case. Novel reinforcing techniques use in-situ formation of reinforcing particles and orientation of filler particles by a magnetic field. In the former case, elastomers are allowed to swell in organometallic compounds which can be hydrolyzed (silicates, titanates), thermolyzed (metal carbonyls) or photolyzed. Other techniques generate glassy particles by in-situ polymerization or use polymers with functional groups reacting with the filler surface. West Germany; Translation. (JES)

DESCRIPTORS: (U) \*POLYMERIZATION, DEFORMATION, ELASTIC PROPERTIES, ELASTOMERS, FILLERS, GLASS, INTERACTIONS, MAGNETIC FIELDS, METAL CARBONYLS, MODELS, MOLECULE MOLECULE INTERACTIONS, MOLECULES, NETWORKS.

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SYRACUSE UNIV NY SCHOOL OF COMPUTER AND INFORMATION  
SCIENCE

WISCONSIN UNIV-MADISON DEPT OF CHEMISTRY

(U) Testbeds for Logic Programming and Very Large  
Databases.

(U) Lewis Base Adducts to Diorganosilylenes.

89

DESCRIPTIVE NOTE: Final rept..

PERSONAL AUTHORS: Gillette, Gregory R.; Noren, George H.;  
West, Robert

SEP 87

PERSONAL AUTHORS: Bowen, Kenneth A.

CONTRACT NO. F49620-86-C-0010

CONTRACT NO. AFOSR-87-0065

PROJECT NO. 2303

PROJECT NO. 2304

TASK NO. B2

TASK NO. A5

MONITOR: AFOSR  
TR-89-0794

MONITOR: AFOSR  
TR-89-0781

UNCLASSIFIED REPORT

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Organometallics, v8 n2 p487-  
491 1989.

ABSTRACT: (U) This grant was funded under the Syracuse  
University Research Instrumentation program to purchase  
equipment in support of research in advanced logic  
programming and its application to artificial  
intelligence, especially extensions and enhancements to  
logic programming which include metallevel programming  
capabilities and concurrent execution. Equipment obtained  
under this grant included two Sun workstations, one  
Motorola C31 workstation tested, and three Xenologic  
Prolog Accelerator boards. This equipment has led  
completion of research in theoretical capabilities of  
metaProlog and enabled the design and implementation of  
metaProlog and to carry out moderate scale knowledge base  
maintenance experiments. Keywords: Interfaces, Expert  
systems. (kr)

DESCRIPTORS: (U) ARTIFICIAL INTELLIGENCE, COMPUTER  
LOGIC, COMPUTER PROGRAMMING, DATA BASES, INSTRUMENTATION,  
MAINTENANCE, MILITARY FACILITIES, PARTICLE ACCELERATORS,  
PROCUREMENT, TEST BEDS, UNIVERSITIES.

IDENTIFIERS: (U) PE61102F, WUAFOSR2304A5.

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ABSTRACT: (U) Silylenes 2a-d were generated  
photolytically at 77 K in (3-Methylpentane) matrices  
doped with ethers, amines, sulfides, phosphines, and  
alcohols. the initially formed free silylenes react upon  
annealing of the matrix to give acid-base complexes  
observed by electronic spectroscopy. For R20, R3N, and  
R2S further warming of the matrix leads to the disilenes  
3a-d. Use of 1-PrOH or sec-BuOH as bases led to silylene-  
alcohol complexes which ultimately yielded products of  
silylene insertion into the O-H bond. Keywords: Silanes,  
Photolysis, Reprints. (aw)

DESCRIPTORS: (U) \*PHOTOLYSIS, \*SILANES, \*ORGANIC  
COMPOUNDS, ACID BASE EQUILIBRIUM, ALCOHOLS, AMINES,  
ELECTRONICS, ETHERS, HEATING, PHOSPHINE, REPRINTS,  
SPECTROSCOPY, SULFIDES, DOPING, ETHERS, SULFIDES,  
ANNEALING.

IDENTIFIERS: (U) PE61102F, WUAFOSR2303B2, \*Lewis Bases,  
\*Diorganosilylenes, Silylenes.

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AD-A209 579 12/6 9/1

STATE UNIV OF NEW YORK AT BINGHAMTON DEPT OF MATHEMATICAL SCIENCES

MASSACHUSETTS UNIV AMHERST

(U) Discrete Time Analysis of a Shut Down Queueing Systems.

(U) Fault Tolerant Multiprocessors and VLSI-Based Systems

DESCRIPTIVE NOTE: Final rept..

DESCRIPTIVE NOTE: Final rept. 15 Feb 87-15 Feb 88.

77

MAR 88

PERSONAL AUTHORS: Klimko, Eugene M.

PERSONAL AUTHORS: Pradhan, DhiraJ

CONTRACT NO. AFOSR-75-2813

CONTRACT NO. AFOSR-87-0161

PROJECT NO. 2304

PROJECT NO. 2304

TASK NO. A5

TASK NO. A2

MONITOR: AFOSR  
TR-89-0775

MONITOR: AFOSR  
TR-89-0782

UNCLASSIFIED REPORT

UNCLASSIFIED REPORT

ABSTRACT: (U) The purpose of this study is to analyze a special type of job shop queueing system which has the following features: 1) A finite number of customers is present initially and no new customers arrive; 2) there are two service stations, each with its own input and each serving the output of the other; and 3) as soon as a customer is served by both stations, he leaves the system. A queueing system with these features is called a shutdown queueing system and it may also be called a clearance problem. Queueing problems of this type arise in connection with fuel and supply facilities for aircraft. A fixed number of aircraft are scheduled for fueling and supply loading. Keywords: Computations; Exponential distributions. (kr)

DESCRIPTORS: (U) \*REFUELING, \*QUEUEING THEORY, \*SHUTDOWNS, \*SYSTEMS ANALYSIS, AIRCRAFT, COMPUTATIONS, EXPONENTIAL FUNCTIONS, FUELS, JOBS, REFUELING, SHOPS(WORK AREAS), STATIONS, STATISTICAL DISTRIBUTIONS, SUPPLIES, SUPPLY DEPOTS, TIME STUDIES.

ABSTRACT: (U) Two significant aspects of fault-tolerant computing were the focus of this project. Concurrent research was carried out as well in the areas of fault tolerant testable VLSI system design and fault-tolerant multiprocessor design. A novel concept for testable RAM designs was developed, too, allowing for the design of large RAMs with built-in test capabilities. Such a testability feature is, in fact, an integral part of the design, not added on adhoc, and as such, is the subject of a patent application filed by the U.S. Air Force. The second major focus of research concentrated on the development of fault-tolerant multiprocessor topologies. It was demonstrated that DeBruijn multiprocessor networks provide a naturally fault-tolerant robust interconnection network. The attractive feature of these networks includes their ability to provide fault-tolerance in a wide variety of applications. Also developed was a new topology, termed Flip Trees, which provides certain optimal fault-tolerant properties. Finally, a practical perspective on distributed agreement algorithms was formulated, which can admit a large variety of faults (rh)

DESCRIPTORS: (U) \*FAULTS, \*MULTIPROCESSORS, \*TOLERANCE, AGREEMENTS, AIR FORCE, ALGORITHMS, DISTRIBUTION, NETWORK FLOWS, NETWORKS, PATENT APPLICATIONS, SELF CONTAINED, TEST AND EVALUATION, TEST METHODS, TOPOLOGY

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AD-A209 576 13/8 20/12 20/6

IDENTIFIERS: (U) PE61102F, WUAF0SR2304A2.

DEACON RESEARCH PALO ALTO CA

(U) Development of Photodeposited Diamond Films.

DESCRIPTIVE NOTE: Final rept. Aug 88-Feb 89.

MAR 89

PERSONAL AUTHORS: O'Keefe, Anthony

CONTRACT NO. F49620-88-C-0099

PROJECT NO. 2301

TASK NO. A1

MONITOR: AFOSR  
TR-89-0779

UNCLASSIFIED REPORT

ABSTRACT: (U) This document details a study of the fundamental physical and chemical processes occurring in hot filament and laser assisted synthetic diamond CVD processes. The chemical model developed in this program permits a detailed analysis of previous investigations. This model suggests that several factors will limit the attainable purity and utility of synthetic diamonds grown by plasma or hot filament CVD techniques. A diamond deposition process based upon selective laser production of the chemical species which give rise to the films is described. This technique holds the promise of growing essentially pure diamond at rates comparable to existing schemes, and should permit co-deposition of selected dopant species to make novel new optic and electro optic devices. An experimental diamond CVD reactor has been designed, developed and tested to provide experimental verification of the model. The reactor has been run in two modes of operation; a hot filament CVD mode, and a laser-assisted hot filament mode. Films deposited in the hot filament mode of operation exhibit the physical characteristics and growth behavior expected for synthetic diamond films. The observed growth kinetics agree with predictions based upon the chemical model developed here. A study based upon a laser-assisted hot filament diamond CVD process suggests that the laser process results in an enhancement of the rate of film growth, although the extent of this enhancement was

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limited by the available laser power. Further investigation using greater laser powers will be required to confirm this result and expand upon the results. (AW)

DESCRIPTORS: (U) \*VAPOR DEPOSITION, \*DIAMONDS, \*FILMS, \*SYNTHETIC STONES, CHEMICAL REACTIONS, CHEMICALS, ELECTROOPTICS, GROWTH(GENERAL), HOT WIRE, KINETICS, LASERS, MODELS, OPERATION, OPTICAL EQUIPMENT, PHYSICAL PROPERTIES, POWER, PURITY, RATES, LASER APPLICATIONS, DOPING.

IDENTIFIERS: (U) PEG1102F, WUAFOSR2301A1, \*Photodeposition.

SAN DIEGO STATE UNIV CA DEPT OF ELECTRICAL AND COMPUTER ENGINEERING

(U) Photodetachment Cross Sections of Negative Halogen Ions in Discharge Media.

88

PERSONAL AUTHORS: Wang, W. C.; Lee, L. C.

PROJECT NO. 2301

TASK NO. A7

MONITOR: AFOSR  
TR-89-0695

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Phys. D: Applied Phys. v21 p675-682 1988.

ABSTRACT: (U) Photodetachment of negative halogen ions occurs in the atmosphere and in discharge systems. The photodetachment cross section of negative halogen ions are generally of interest for the studies of laser and plasma physics. Laser-induced increases of discharge current were observed in the discharge media containing various halogen compounds (F<sub>2</sub>, HF, HCl, Cl<sub>2</sub>, HBr, CH<sub>3</sub>Br, CH<sub>3</sub>I and CH<sub>2</sub>I<sub>2</sub>) in N<sub>2</sub>. The increase of transient current were attributed to the photodetachment of negative ions in the discharge media. On the basis of general considerations, the negative ions present in the discharge are assumed to be the atomic halogen negative ions. Photodetachment cross sections were determined from the current increases as a function of laser flux. Photodetachment cross sections of F<sup>-</sup>, Cl<sup>-</sup>, Br<sup>-</sup> and I<sup>-</sup> are 0.75, 2.5, 3.3 and 7.0 x 10 to the -17th power sq cm at 193 nm and 0.6, 1.0, 1.5 and 3.0 x 10 to the -17th power sq cm at 248 nm, respectively. These data are compared with the earlier results of negative ion beam experiments and theoretical calculations. Keywords: Methyl bromide; Methyl iodide; Methylene iodide; Nitrogen; Fluorine; Hydrogen fluoride; Hydrochloric acid; Chlorine; Hydrogen bromide; Bromine; Iodine; Reprints. (AW)

DESCRIPTORS: (U) \*ANIONS, \*CROSS SECTIONS, \*HALOGENS, \*PHOTODISSOCIATION, BROMIDES, BROMINE, CHEMICAL

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DISSOCIATION, CHLORINE, COMPUTATIONS, ELECTRIC CURRENT, ELECTRIC DISCHARGES, FLUORINE, FLUX(RATE), HALOGEN COMPOUNDS, HYDROCHLORIC ACID, HYDROGEN COMPOUNDS, HYDROGEN FLUORIDE, IODIDES, IODINE, ION BEAMS, LASERS, MEDIA, METHYL RADICALS, METHYLENES, NITROGEN, PHOTOCHEMICAL REACTIONS, PLASMAS(PHYSICS), REPRINTS, THEORY, TRANSIENTS.

PENNSYLVANIA STATE UNIV UNIVERSITY PARK DEPT OF CHEMISTRY

(U) Synthesis of Polyphosphazenes Bearing Geminal (Trimethylsilyl)methylene and Alkyl or Phenyl Side Groups.

MAY 89

IDENTIFIERS: (U) PE61102F, WUAFOSR2301A7.

PERSONAL AUTHORS: Allcock, Harry R.; Brennan, David J.; Dunn, Beverly S.

CONTRACT NO. AFOSR-84-0147

PROJECT NO. 2303

TASK NO. B2

MONITOR: AFOSR  
TR-89-0690

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. In The Macromolecules, V22 n4  
P1534-1539 1989.

ABSTRACT: (U) The ring-opening polymerization of a series of organosilylcyclophosphazenes of formula gem-N3P3CL4(CH2SiMe3)(R), where R = C2H5, 1-C3H7, n-C4H9, neo-C5H11, and C6H5, is described and is compared with the polymerization behavior of the non-silylated counterparts, gem-N3P3Cl4(CH3)(R). Polymerization is markedly favored by the presence of the organosilicon group. In the organosilyl derivatives, geminal t-C4H9 or neo-C5H11 co-substituent groups retard polymerization compared to CH3, C2H5, n-C4H9, or C6H5 groups. The 1-C3H7 group has an intermediate effect. It is speculated that the t-C4H9, neo-C5H11, and 1-C3H7 groups give rise to polymerization-inhibiting side reactions. The polymers prepared by the polymerization of gem-N3P3Cl4(CH2SiMe3)(R) were subjected to chlorine replacement reactions by treatment with sodium trifluoroethoxide. Reactions carried out in toluene solution allowed replacement of chlorine without concurrent attack on the organosilyl groups. In THF solvent, CH2-Si bond cleavage occurred to replace the (trimethylsilyl) methylene units by methyl groups. Reprints. (AW)

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DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVI09K

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DESCRIPTORS: (U) \*POLYMERIZATION, \*PHOSPHAZENE, CHLORINE, METHYL RADICALS, METHYLENES, ORGANIC COMPOUNDS, PHENOLS, POLYMERS, REPLACEMENT, REPRINTS, SIDES, SILICON COMPOUNDS, SODIUM, SOLUTIONS(MIXTURES), SYNTHESIS(CHEMISTRY), TOLUENES, SILICON, ALKYL RADICALS, PHENYL RADICALS, CYCLIC COMPOUNDS.

ILLINOIS UNIV AT URBANA DEPT OF CHEMISTRY  
(U) The Effect of Fluoride on the Sol-Gel Process.  
88

IDENTIFIERS: (U) PE61102F, WUAFOSR2303B2,  
\*Polyphosphazenes, Side Groups, Ring Opening  
Polymerization, Rings(Chemistry)...

PERSONAL AUTHORS: Winter, R.; Chan, J. B.; Frattini, R.; Jonas, J.

CONTRACT NO. AFOSR-85-0345, NSF-DMR86-12860

PROJECT NO. 2303

TASK NO. A3

MONITOR: AFOSR  
TR-89-0254

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Intl. of Non-Crystalline Solids, v105 p214-222 1988.

ABSTRACT: (U) In view of its well-recognized technological importance, the sol-gel process for glass preparation continues to receive major experimental attention. For the silica-based process, the gelation occurs in two stages, the hydrolysis stage and the condensation stage. Depending on the experimental conditions used, these two stages of gelatin can be highly interlocked thus leading to condensation between partially hydrolyzed species. Natural abundance  $^{29}\text{Si}$  NMR spectroscopy and laser Raman scattering experiments were employed to investigate the effects of fluoride ion on the gelation process in tetramethylorthosilicate at pH = 6.4. In addition, the BET method was used to carry out a pore analysis of the dried gels. Both the NMR and Raman data show that the presence of fluoride anions not only accelerates the gelation process but leads to a different polymerization process. The condensation proceeds via the formation of higher branched polymers, and the dimers and trimers do not play a significant role in the polymerization process. A high percentage of organic OCH<sub>3</sub> groups is present in the silicon network at the gelation point. The pore analysis of dried gels shows that the fluoride ion leads to the formation of a loose and relatively open silica network with a large fraction of mesopores. Reprints. (AW)

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DESCRIPTORS: (U) \*ANIONS, \*FLUORIDES, \*GELATION, \*SILICA  
GLASS, \*POLYMERIZATION, CONDENSATION, DRY MATERIALS, GELS,  
HYDROLYSIS, IONS, LIGHT SCATTERING, NETWORKS, POLYMERS,  
PREPARATION, RAMAN SPECTRA, REPRINTS, SILICON, SILICON  
DIOXIDE, SPECTROSCOPY.

DELAWARE UNIV NEWARK DEPT OF MATHEMATICAL SCIENCES

(U) The Inverse Scattering Problem for Acoustic and  
Electromagnetic Waves.

DESCRIPTIVE NOTE: Final rept. 1 Jun 86-31 May 89.

IDENTIFIERS: (U) PE61102F, WUAFOSR2303A3, Sol Gel  
Process, Tetramethylorthosilicate, Silicate/  
Tetramethylortho.

MAY 89

PERSONAL AUTHORS: Colton, David; Monk, Peter; Ochs, R. L.

CONTRACT NO. AFOSR-86-0087

PROJECT NO. 2304

TASK NO. A9

MONITOR: AFOSR  
TR-89-0608

UNCLASSIFIED REPORT

ABSTRACT: (U) This research project was concerned with  
the problem of determining the physical and geometric  
properties of an obstacle by probing with time harmonic  
acoustic or electromagnetic waves. A new method has been  
developed to solve problems of this type based on the  
theory of Herglotz wave functions and complete sets of  
solutions to the Helmholtz and Maxwell equations.  
Numerical examples have been given for the case of  
acoustic waves. (jhd)

DESCRIPTORS: (U) \*ACOUSTIC SCATTERING, \*INVERSE  
SCATTERING, ELECTROMAGNETIC SCATTERING, ACOUSTIC WAVES,  
ELECTROMAGNETIC RADIATION, GEOMETRY, MAXWELLS EQUATIONS,  
PHYSICAL PROPERTIES, WAVE FUNCTIONS.

IDENTIFIERS: (U) PE61102F, WUAFOSR2304A9.

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OREGON UNIV EUGENE DEPT OF PHYSICS

(U) Quantum Electrodynamical Approach to Multiphoton Ionization in the High-Intensity Field.

DEC 88

PERSONAL AUTHORS: Guo, D-S; Aberg, T.

CONTRACT NO. AFOSR-87-0026, NSF-PHY85-16788

PROJECT NO. 2302

TASK NO. A4

MONITOR: AFOSR  
TR-89-0416

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Jnl. of Physics A, V21 p4577-4591 1988.

ABSTRACT: (U) The development of high-power lasers has made it possible to achieve light intensities which are of the order of one atomic unit. At these field strengths relativistic effects become important. It is thus of interest to study multiphoton ionization from the point of view of quantum electrodynamics (QED). In recent work Filipowicz (1985) obtained the solution of the Dirac equation for an electron interacting with a quantized electromagnetic plane wave. He also discussed the non-quantum limit of this solution. We solve the Dirac equation for an electron interacting with a quantized and elliptically polarized electromagnetic field. We use the solution to obtain a relativistic S-matrix amplitude for multiphoton ionization in the high-intensity limit. Its non-relativistic limit is also derived and is used to construct a multiphoton transition-rate formula which is compared with previous results. Reprints. (AW)

DESCRIPTORS: (U) \*PHOTOIONIZATION, \*QUANTUM ELECTRODYNAMICS, AMPLITUDE, ELECTROMAGNETIC FIELDS, ELECTROMAGNETIC RADIATION, ELECTRONS, EQUATIONS, FIELD INTENSITY, HIGH POWER, INTENSITY, LASERS, LIGHT LIMITATIONS, PLANE WAVES, POLARIZATION, QUANTIZATION, REPRINTS.

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DTIC REPORT BIBLIOGRAPHY

SEARCH CONTROL NO. EVI09K

AD-A209 063 4/1 20/14

AD-A209 062 20/3 9/3

PENNSYLVANIA UNIV PHILADELPHIA DEPT OF PHYSICS

MASSACHUSETTS INST OF TECH CAMBRIDGE

(U) Inverse Scattering: Ionospheric Structure Determination.

(U) Tunable Microwigglers for Free-Electron Lasers.

APR 89

DESCRIPTIVE NOTE: Final technical rept. 1 Jul 79-30 Jun 80.

PERSONAL AUTHORS: Chen, S. C.; Bekefi, G.; DiCecca, S.; Tenkhn, R.

AUG 80

PERSONAL AUTHORS: Cohen, Jeffrey M.

CONTRACT NO. AFOSR-89-0082

CONTRACT NO. F49620-79-C-0127

PROJECT NO. 2301

PROJECT NO. 2304

TASK NO. A8

TASK NO. A4

MONITOR: AFOSR TR-89-0721

MONITOR: AFOSR

TR-89-0742

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SUPPLEMENTARY NOTE: Pub. in Applied Physics Letters, v54 n14 p1299-1301, 3 Apr 89.

ABSTRACT: (U) A paper entitled 'Curved Space Scattering' has already been sent to AFOSR. The abstracts of the paper and report contain statements of the research accomplished. In addition we have looked into the following problems: a. We have employed the Kanal-Moses variational principle to treat the synthetic data discussed in the report listed in 1.1. It was found that if the initial trial function is within 10% of the actual result, then the K-M variational principle gives the result to better than 1%. We have generalized the results of Kay for n-poles in such a way that practical applications are possible, e.g. to the ionosphere. To test the method we are in the process of studying the 4- and 10-pole cases before treating the 100-pole case. (RH)

DESCRIPTORS: (U) \*INVERSE SCATTERING, \*IONOSPHERE, ABSTRACTS, DETERMINATION, PAPER.

IDENTIFIERS: (U) PE61102F, WUAFOSR2304A4.

ABSTRACT: (U) The design, construction, and test results of a novel microwiggler structure with a periodicity of 2.4 mm are presented for free-electron laser applications. The experimentally demonstrated tunability of field amplitude provides versatile means for field tapering. optical klystron configurations, improving field uniformity, and electron beam matching at the wiggler entrance. Reprints. (jhd)

DESCRIPTORS: (U) \*FREE ELECTRON LASERS, \*WIGGLER MAGNETS, AMPLITUDE, CONFIGURATIONS, ELECTRON BEAMS, KLYSTRONS, LASER APPLICATIONS, MATCHING, OPTICAL PROPERTIES, REPRINTS, TEST AND EVALUATION, TUNING.

IDENTIFIERS: (U) PE61102F, WUAFOSR2301A8.

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AD-A208 989 7/5 7/4

OREGON UNIV EUGENE DEPT OF PHYSICS

COLUMBIA UNIV NEW YORK DEPT OF CHEMISTRY

(U) Photon-Energy-Sensitive Si L(2,3) VV Auger Satellite,

(U) Photochemical Probes for Structure of Zeolites and for Dynamics of Reactions of Molecules Adsorbed on Porous Solids.

89

PERSONAL AUTHORS: Wolcik, J. C.; Pianetta, P.; Sorensen, S. L.; Grasmann, B.

DESCRIPTIVE NOTE: Rept. for 1986-1988,

89

CONTRACT NO. AFOSR-87-0026

PROJECT NO. 2301

PERSONAL AUTHORS: Turro, Nicholas J.

TASK NO. A4

PROJECT NO. 2303

MONITOR: AFOSR TR-89-0734

MONITOR: AFOSR TR-89-0722

UNCLASSIFIED REPORT

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Physical Review B, v39 p6048-6051 1989.

SUPPLEMENTARY NOTE: Pub. in Molecular Dynamics in Restricted Geometries, ch14 p387-404 1989.

ABSTRACT: (U) The high-energy satellite structure which appears at 103 eV kinetic energy in the Si L sub 2,3 VV Auger spectrum has been studied with synchrotron radiation. We find the intensity of the satellite to be sensitive to the photon energy in the vicinity of the Si K edge (nu=1840 eV). The results of an atomic Hartree-Fock Delta SCF (self-consistent field) calculation are presented which account for the energy position of the satellite, and an atomic model is described which accounts for its dependence on the excitation photon energy. Keywords: Silicon electronic structure; Auger satellites; Reprints. (jhd)

DESCRIPTORS: (U) \*AUGER ELECTRON SPECTROSCOPY, \*ELECTRONIC STATES, \*SILICON, \*SYNCHROTRON RADIATION, CONSISTENCY, ENERGY, EXCITATION, HIGH ENERGY, INTENSITY, KINETIC ENERGY, PHOTONS, POSITION(LOCATION), REPRINTS.

IDENTIFIERS: (U) WUAFOSR2301A4, PE61102F, Auger satellites.

DESCRIPTORS: (U) \*PHOTOLYSIS, \*SILICATES, \*ALUMINUM COMPOUNDS, \*ION EXCHANGE RESINS, \*MOLECULAR STRUCTURE, \*SURFACE REACTIONS, ADSORPTION, CATALYSIS, CATIONS, DENSITY, DYNAMICS, ELECTROSTATIC FIELDS, GEOMETRY, KETONES, MOBILITY, MOLECULES, PHOTOCHEMICAL REACTIONS, POROUS MATERIALS, PROBES, REPRINTS, SHAPE, Reprints. (aw)

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CONTINUED

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SIZES(DIMENSIONS), SOLIDS, SUBSTRATES, TOPOLOGY, CHEMICAL RADICALS.

CALIFORNIA UNIV SAN DIEGO LA JOLLA DEPT OF CHEMISTRY

IDENTIFIERS: (U) PE61102F, WUAFOSR230382, \*Zeolites, Pentasil Topology, Faujasite Topology, Radical Pairs.

(U) Dimesitylsilyl Derivatives of Zirconium,

89

PERSONAL AUTHORS: Roddick, Dean M.; Heyn, Richard H.; Tilley, T. D.

CONTRACT NO. AFOSK-95-0228

PROJECT NO. 2303

TASK NO. B2

MONITOR: AFOSR  
TR-89-0394

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Organometallics. v8 n2 p325-330 1989.

ABSTRACT: (U) The development of early-transition-metal silicon chemistry has been hampered by a lack of general synthetic methods. To date most metal silyl complexes have been prepared by displacement of halide ion from the metal by a silyl anion. However, application of this procedure is somewhat restricted by the availability of suitable silyl anion sources. In particular, there is a limited range of reagents for preparation of primary and secondary metal silyl complexes, since stable silyl anion reagents with Si-H bonds are quite rare. Chemical reactions. Reprints. (jes)

DESCRIPTORS: (U) \*DISPLACEMENT, \*PHOTOCHEMICAL REACTIONS, AVAILABILITY, CHEMICAL AGENTS, CHEMICAL REACTIONS, HALIDES, IONS, LIMITATIONS, SYNTHESIS.

IDENTIFIERS: (U) PE61102F, WUAFOSR230382.

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AD-A208 930 20/10

TEXAS UNIV AT AUSTIN DEPT OF CHEMISTRY

(U) Use of Quantum Mechanical Models in Studies of Reaction Mechanisms.

88

PERSONAL AUTHORS: Dewar, Michael J.

CONTRACT NO. AFOSR-86-0022

PROJECT NO. 2303

TASK NO. B2

MONITOR: AFOSR  
TR-89-0348

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in International Jnl. of Quantum Chemistry: Quantum Chemistry Symposium, v22 p557-566 1988.

ABSTRACT: (U) The problems involved in determining the mechanisms of reactions by quantum mechanical calculations are discussed. Various precautions must be taken if the results of any calculation are to be chemically meaningful. Ab initio studies of reactions must also be carried out at a high level, using large basis sets and allowing for electron correlation. Such calculations are usually restricted to the simplest example of a reaction. More information can usually be obtained at far less cost through AM1 calculations for a number of examples of a reaction for which experimental data are available. These points are illustrated by recent studies of the Cope rearrangement. Keywords: Quantum mechanical models, Reaction mechanisms, Reprints. (jhd)

DESCRIPTORS: (U) \*CHEMICAL REACTIONS, \*QUANTUM CHEMISTRY, \*QUANTUM THEORY, CORRELATION, COSTS, ELECTRONS, EXPERIMENTAL DATA, MODELS, REPRINTS, RESPONSE.

IDENTIFIERS: (U) PE61102F, WUAFOSR2303B2, Ab initio calculations.

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